4.4 BIOLOGICAL RESOURCES

This section describes the environmental setting and potential impacts for important biological resources of the project study area. The biological resources addressed are those considered potentially vulnerable to impacts of the proposed actions. These resources include four ecological communities - the subtidal sand-bottom community, the subtidal hardbottom community, the kelp forest community, and the beach community - and species assemblages of marine mammals and fish, birds, and turtles.

The study area for biological resources is the geographic area potentially affected by the project. The study area varies with the type of biological resource considered and is defined at the beginning of the environmental setting section for each resource.

The following description of the environmental setting consists of several related subsections. While together they describe the existing environmental conditions, they are separated into individually numbered sections for ease of review.

4.4.1 Regional Setting

PRC-421 is located in the coastal zone of the Santa Barbara Channel (SBC). The SBC occupies the northwest corner of the Southern California Bight (SCB) and comprises a relatively protected and benign environment for marine organisms. The SBC is considered a biogeographical transition zone between the northern Oregonian Province and the marine assemblages of southern California. The remnant pier and the associated pilings are located adjacent to the shore of Santa Barbara County and near natural, offshore oil and gas seeps that create oil sheen and contamination on the water surface. The following discussion provides the regional setting for the project area. The discussion includes a brief description of the principal physical characteristics of the SCB and provides a discussion of the region's major biological resources and the environmental factors that affect these resources.

4.4.1.1 General Description

Climate

The climate of the SCB is characterized by short, mild winters, and warm, dry summers. Annual precipitation averages 18 inches (46 cm), 90 percent of which falls between November and April. Monthly air temperatures along the coast range from about 46°F (8°C) in winter to over 68°F (20°C) in summer. Sea breezes combine with the prevailing winds from the northwest during summer months to produce strong onshore winds. In winter, coastal winds tend to be from the southeast (Resource Insights 1999).

Ocean Currents

The California Current, a diffuse and meandering water mass, flows south along the California coast. South of Point Conception, the current moves offshore following the edges of the continental borderland. It approaches the coast again near Baja California. From that point, the Southern California Countercurrent flows north along the coast (Resource Insights 1999).

The mean flow in the SBC consists of a cyclonic circulation. Mean currents are directed westward along the north shore of the Channel and eastward along the north side of the Channel Islands. The magnitude of the cross-shelf shear between along-shelf currents on opposite shelves fluctuates seasonally, being greatest during the summer and early fall, somewhat weaker in late fall and early winter, and weakest in later winter and spring. Nearshore currents are strongly influenced by a combination of wind, tides, local physiography, and density structure, i.e., gradients in the density of the water due to differences in temperature and salinity (Resource Insights 1999).

Water Temperature

Water temperatures fluctuate throughout the year in response to seasonal and diurnal variations in currents, wind, air temperature, relative humidity, cloud cover, waves, and turbulence. Surface water temperatures of coastal waters may vary as much as two degrees Celsius in a single day, depending on the time of year and prevailing oceanographic and meteorological conditions. When surface and bottom temperatures differ substantially, a thermocline, which is a temperature gradient between depth layers with relatively uniform water temperatures, may develop. A thermocline typically develops during summer months off the southern California coast (Resource Insights 1999).

Salinity

Salinity is relatively constant in the open ocean, but it varies in the nearshore environment as a result of freshwater runoff, direct rainfall, and evaporation. Maximum salinities occur in summer and minimum salinities occur during winter storms (Resource Insights 1999).

Generalized Food Web

Phytoplankton, which consists of single-celled algae suspended in the water, comprises the base of most food chains in the SCB (Daily et al. 1993), although benthic macroalgae, including kelp, are often more important locally. Zooplankton, consisting of small animals such as copepods and the larval stages of macroinvertebrates and fish, consume phytoplankton. Invertebrates and fish consume zooplankton, and also eat each other. Benthic invertebrates and demersal fish, which live on the sea bottom, graze on benthic algae, filter plankton from the water, and prey on other invertebrates and fish. Many benthic organisms feed entirely on dead material that accumulates on the bottom or is suspended in the water. Marine mammals, birds, and turtles prey on invertebrates and fish. Over 5,000 species of benthic invertebrates, 481 fish species, over 195 bird species, and 40 species of marine mammals inhabit the SCB (Dailey et al., 1993).

Major Habitat Types and Ecological Communities

Point Conception, located approximately 33 miles (53 km) west of PRC-421, has been recognized as the dividing point between the Oregonian and Californian biogeographic provinces for intertidal organisms (Hall 1964). The SCB, which extends south of Point Conception to the Mexican border, exists as a unique biogeographical transition zone between these two provinces exhibiting a diversity of habitats as well as benthic flora and fauna. Hydrographic conditions, which are representative of both provinces are found throughout the SCB allowing species from each area to coexist in relative close proximity to one another (BLM 1979). In addition, there exist species endemic to the SBC with highly limited ranges (as little as 100 kilometers).

Important marine habitats in the SCB include embayments, rocky and sedimentary intertidal and subtidal habitats, deep-water sedimentary and rocky substrate habitats, and the pelagic (open water) zone (Dailey et al. 1993). Four ecological communities - the subtidal sand-bottom community, the subtidal rocky community, the kelp forest community, and the sandy intertidal community - are present in the vicinity of the project site. The subtidal rocky habitat is important within the project site because it supports the productive and sensitive kelp forest community. A sand beach habitat characterizes the shore near the project site.

Hard Bottom

Two types of hard bottom are located in the project area. These include natural hard bottom, which is probably mainly low siltstone outcrops or reefs, and boulders and rubble. A major hard bottom structure, identified by side scan sonar surveys by Fugro (1999) (Appendix F), extends from south to east of the pier (see Section 4.1.1.1, Figure 4.1-1). In addition, other smaller areas of hard bottom were identified, one just west and another north of the pier amid and adjacent to the bents of old steel pilings that supported the pier (Littoral Ecological & Environmental Services 2000).

The imported boulders and rubble are located in a rock pile approximately 91 m (300 ft) inshore of the remnant pier structure's columns. This pile is approximately 1.5 m (5 ft) in diameter and 1.2 m (4 ft) high, covering an area of approximately 200 m^2 (0.05 acres) (Littoral Ecological & Environmental Services 2000).

Soft Substrate

Based on the discussion in the *Essential Fish Habitat Assessment* (EFHA) prepared by Littoral Ecological & Environmental Services prepared in September 2001(presented as Appendix G of this EIR), soft (sedimentary) substrate dominated most of the seafloor in the quadrant between the southwesterly and northwesterly axes extending from the western corners of the pier. According to the review (conducted for the EFHA) of the underwater videotapes produced for the *Construction Dive Survey* (Appendix H), the soft substrate appears to be predominantly fine silty sand with small ripplemarks. This material appears similar to that observed at similar depths in areas west of Goleta. It is likely that the sediments in the project

area support similar biological assemblages to those observed in other similar areas (Littoral Ecological & Environmental Services 2000).

Man-made Structures

All of the man-made structures provide hard substrate. These structures comprise primarily concrete and steel in several forms, i.e., I-beams, rebar, conductors, and sheet pile, but in one area, the structure was formed partially of imported rock. Most of the concrete and steel structures are in poor condition. The most significant resources on these structures are the bands of mussels growing on the upper several feet of the columns (Littoral Ecological & Environmental Services 2000).

4.4.1.2 Major Biological Resources

Algae

Benthic algae and marine grasses are discussed in NOAA (2000), Murray and Bray (1993), and Murray (1974). Most attached algal species are limited to the nearshore, subtidal shallower than 164 ft (50 m), due to light limitation. Giant kelp (*Macrocystis pyrifera*), common from 10 to 100 ft (3 to 30 m), is a keystone species that transforms rocky reefs into lush underwater forests. Other smaller kelps include boa kelp (*Egregia menziesii*), sea palms (*Eisenia arborea* and *Pterygophora californica*), and oarweeds (*Laminaria* spp. and *Agarum fimbriatum*) (NOAA 2000). The kelpforest provides food and shelter for a diverse assemblage of plants and animals. Giant kelp provides a vertical structure and large surface area for attachment of sessile invertebrates along the entire length of the plant including the highly convoluted holdfast, which is usually attached to solid substrate. In the vicinity of the remnant pier there is thick kelp bed extending from water depths of approximately 30 ft (9 m) toward shore (refer to Section 4.4.6). The nearshore algal bed is dominated by *Egregia* and other algae, rather than *Macrocystis*.

Invertebrates

Recent summaries of the invertebrate benthos of the SBC can be found in the draft EIS for the Channel Islands National Marine Sanctuary (NOAA 2000) and the review by Thompson et al. (1993). Other notable papers, as listed in Section 8.0, References, include: Bright (1974), Allan Hancock Foundation (1965), BLM (1977), Hartman and Barnard (1960), Jones (1969), Lewbal *et al*. (1981), Nekton (1983), and Pequegnat (1964). Much of this information is also summarized in BLM (1979).

Most of the Santa Barbara County coastline and 93 percent of the Ventura County coastline is composed of sandy beaches often backed by cliffs. Upper beach areas are typically dominated by amphipods (small crustaceans) of the genera *Orchestoidea* and *Orchestia*. Lower beach areas near Santa Barbara, which characterize exposed surf-swept beaches, are dominated by the sand crab (*Emerita analoga)*.

Red, purple, and white sea urchins are major predators of kelp. Suspension-feeding invertebrates of deeper reefs include sponges, sea anemones, sea fans, plume worms, bryozoans, and tunicates.

Over 90 percent of deep-water benthic habitats consist of fine sand, and silt and clay sediments in deeper portions. Invertebrates in these areas are infaunal detritus feeders such as sea pens, polychaete worms, echiuran worms, amphipods, brittle stars, and small snails and clams, and epifauna such as shrimp, octopus, sea cucumbers, sea stars, and heart urchins (NOAA 2000).

Invertebrates are the dominant catch of the commercial fisheries in the area. Data collected from California Department of Fish & Game Fish Block 654, within which PRC-421 is located, show that for the past several years (1989-1999) the most abundant species caught by commercial fishing vessels have been urchins, ridgeback shrimp, sea cucumbers, lobsters, and crabs (see Table 4.4-3). Squid and spot prawns have also been abundant. Shrimps, prawns, and sea cucumbers are taken by trawl. With the exception of fishing for halibut, trawling is prohibited in State waters, except within the California Halibut Trawl Grounds, which extend from Pt. Dume to Pt. Arguello and include the area offshore the pier within PRC-421.

Fish and Fisheries

About 481 species of fish inhabit the SBC (Cross and Allen 1993). This diversity is due to the previously mentioned transitional nature of the area as well as the variety of habitats available: soft bottom, rock reefs, kelp beds, estuaries, bays, and lagoons (USN 2000). Pelagic, nearshore schooling fishes include Pacific barracuda, northern anchovy, Pacific herring, jack mackerel, and Pacific bonito. Rockfish are abundant in rocky areas, reefs, and deepwater canyons. Garibaldi, sheephead, senorita, opaleye, and bass are found in rocky areas and reefs, kelp beds, and deepwater canyons. Demersal flat fish are common on sedimentary bottoms (NOAA 2000).

A three-year study (1995-1997) of the fish associated with Platform Holly, which is approximately 2 miles (3 km) offshore of PRC-421, found a relatively high species richness: 28 species (Schroeder 1999). This species richness remained relatively stable throughout the year. The three most abundant fish species collected were pelagics: sardine (mean density 1,341.3/35,315 ft^3 or 1,341.3/1,000 m^3), jack mackerel (115.3/35,315 ft^3 or 115.3/1,000 m^3), and silversides (102.6/35,315 ft^3 or 102.6/1,000 m^3). Platform Holly was the only platform (of nine surveyed) where silversides were recorded.

Deep-sea or midwater fish (50 - 600 m [165 - 1,970 ft]) comprise about 200 species in California, and over 50 percent of those taxa are found in the SCB (Horn 1980). The most abundant midwater fish are members of the families Myctophidae (lantern fishes), Gonostomatidae (lightfishes) and Bathylagidae (deep-sea smelts). Although many midwater species migrate toward the surface at night, these species are not likely to be present nearshore in the vicinity of PRC-421.

The MMS (1983) includes nine taxa (flatfishes, lingcod, midshipman, ratfish, rockfish, sablefish, soupfin and spiny dogfish sharks, and surfperch) as the most commonly occurring offshore demersal fishes of the SBC. Pelagic taxa, dominated by the northern anchovy, include tuna, sharks, mackerel, salmon, bonito, yellowtail, and billfishes (MMS 1983).

The variety of marine habitats in the SBC support diverse and valuable harvests for commercial and recreational fishing. Principal gear employed by commercial fishermen in the region include purse seine, trawl, trap, diving, gill net, and hook and line. The purse seine fishery targets mainly pelagic schooling fishes such as anchovy, sardines, and mackerel. Bottom trawls are used for flatfish and rockfish (as well as for invertebrates), but, as noted above, trawling in State waters is allowed only for halibut and is limited to the aforementioned California Halibut Trawl Grounds. Gill net fisheries target a wide range of species including halibut, seabass, rockfishes, and some sharks (JOFLO 1986). Hook and line (set longline and vertical) primarily targets rockfish, though these fish have seriously declined in recent years. Trolling is conducted for salmon, albacore, and halibut (NOAA 2000). Fishing seasons and peak months for some of the more abundant species are provided in Table 4.4-1.

Table 4.4-1. Commercial Fishing Seasons for most abundant species caught near Platform Holly (2 miles [3 km] south of PRC-421 Pier)

Species - Gear	Open Season	Peak Months
Crab (*Cancer* spp.) - trap	Year round	Dec. - April
Halibut – gillnet	Year round	Feb. - June
Halibut – trawl	June 15 - March 15	June - Aug., Nov - Jan.

Purse seining occurs year-round throughout the SBC; however, landings are highly variable. This fishery targets pelagic schooling species such as squid, mackerel, Pacific bonito, and northern anchovy. Purse seining lands the most fish by weight of any gear type used in the SBC. Catches are sporadic but are usually highest during fall months. In recent years there have been several purse seine vessels docked in the local harbors of Ventura, Channel Islands, and Port Hueneme. Purse seiners encircle entire schools of target species during fishing operations. The catch is retrieved by pursing the net with the aid of a small skiff. Purse seiners fish in most water depths of the local area (Continental Shelf Associates, Inc. 1995).

The trap fishery in the SBC concentrates on three species, rock crab, spider crab, and the California spiny lobster. Trap fishing occurs all year from nearshore to about 330-ft (100-m) water depths. Crab may be fished all year, but the season for spiny lobster is only the months from October through March. As required by law, traps are baited and deployed in strings from 5 to 25 traps along depth contours. Traps are marked by buoys and must be tended by the fisherman every 96 hours or when conditions permit (Continental Shelf Associates, Inc. 1995).

Hook and line fishing in the local area consists mostly of bottom fishing and to a lesser degree, trolling within the water column. Bottom fishing is the most commonly used recreational fishing technique used in the project area. Bottom hook and line fishing in the region primarily targets various rockfishes, as well as other species associated with artificial or natural hard bottoms. Hook and line fishermen typically locate benthic fishing areas using multiple forms of navigation equipment. Commercial hook and line (set longline and vertical) fishing primarily targets rockfish, though these fish have seriously declined in recent years.

Trawling or dragging the seafloor for ocean shrimp, spot shrimp, and ridgeback shrimp, flatfishes, and rockfishes occurs outside the State 3-mile (4.8 km) limit in waters of at least 330-ft (100-m) depths. As previously stated, commercial trawling is prohibited within three nautical miles (5.6 km) of shore (State waters) for all species except halibut within the California Halibut Trawl Area between Pt. Dume and Pt. Arguello in mid-June to mid-March (Continental Shelf Associates, Inc. 1995).

Diving for sea urchin, and historically abalone (commercial fishing for abalone was closed in the late 1990s), and sea cucumber takes place in water depth less than 95.5 ft (30 m). While some divers harvest urchins from rocky areas and kelp beds along the mainland coast, the most productive grounds are around the Channel Islands. The peak sea urchin season extends from January to June when Japanese divers are unable to meet market demands because of monsoon conditions on their fishing grounds (Continental Shelf Associates, Inc. 1995).

Table 4.4-2 provides a listing of the number of licensed commercial fishing vessels operating in the four SBC ports (Santa Barbara, Ventura, Oxnard, and Port Hueneme) for the 10-year period from 1990 through 1999. These numbers probably overestimate the actual number of fishing vessels as some vessels are licensed for more than one gear type. These data indicate a general decrease in licensed vessels over the period, with substantially reduced numbers occurring in the latest three years.

Fish Block 654.

The ARCO PRC 421 Pier is located in California Department of Fish & Game Fish Block No. 654; a 10-minute latitude by 10-minute longitude area of the SBC that extends from just east of Goleta Point to approximately 2 miles (3 km) west of Naples (see Figure 4.4-1). Fish Block 654 includes the shoreline and extends into water depths of approximately 1,300 ft (400 m); the seafloor habitat varies from rocky shelf in the nearshore to soft sediments in water depths of approximately 40 ft (12 m) and more.

Within Fish Block 654, catch records (see Table 4.4-3) indicate that over the 10-year period from 1989 through 1999 and, until it became a limited entry fishery and closed periods were instituted in 1999, urchins contributed the most poundage. Typical of most nearshore Fish Blocks in the SBC, other important commercial taxa include crab, lobster and halibut; occasional relatively large catches of bonito and squid are also reported from this Block.

Table 4.4-2. Commercial Fishing Vessels within the Santa Barbara Channel Harbors (1990-1999)

Harbor	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*Annual Average*
Line Gear											
Port Hueneme	6	5	1	4	4	9	7	4	7	5	5
Oxnard	47	41	24	35	46	59	54	59	49	61	48
Santa Barbara	57	64	73	77	94	90	91	109	71	83	81
Ventura	88	94	78	103	77	75	54	47	40	33	69
Other Gear											
Port Hueneme	36	62	45	4	16	22	2	2	2	3	19
Oxnard	126	116	116	119	111	118	90	84	74	72	103
Santa Barbara	287	308	319	297	280	215	176	144	130	134	229
Ventura	156	142	155	101	83	61	38	38	26	21	82
Gill Net or Purse Seine											
Port Hueneme	24	27	15	24	34	48	63	50	34	90	41
Oxnard	26	16	6	17	28	10	20	13	20	20	18
Santa Barbara	62	59	40	42	27	21	33	20	24	27	36
Ventura	80	68	50	55	49	53	56	40	38	61	55
Pot or Trap											
Port Hueneme	4	4	3	2	3	5	2	6	2	4	4
Oxnard	53	27	20	25	34	56	64	60	55	48	44
Santa Barbara	98	87	87	78	100	99	102	96	98	85	93
Ventura	38	35	39	33	34	42	57	36	42	29	39
Troll											
Port Hueneme	0	0	0	0	1	1	0	2	0	1	<1
Oxnard	1	0	0	0	0	12	4	7	13	2	4
Santa Barbara	1	5	0	5	8	56	23	22	34	20	17
Ventura	4	0	2	3	2	14	9	6	16	5	6
Trawl											
Port Hueneme	3	4	0	3	2	2	3	2	5	2	3
Oxnard	5	3	4	3	8	4	5	1	11	14	6
Santa Barbara	33	55	29	18	37	26	19	18	26	33	29
Ventura	20	21	16	7	17	18	18	5	10	11	14
Shrimp Trawl											
Port Hueneme	0	0	0	2	6	3	5	4	8	5	3
Oxnard	0	0	0	0	5	16	15	13	12	16	8
Santa Barbara	0	0	0	1	22	21	29	30	38	42	18
Ventura	0	0	0	1	14	18	26	15	18	21	11
Dredge											
Port Hueneme	0	0	0	0	0	0	0	0	0	0	0
Oxnard	0	0	0	0	0	0	0	0	0	0	0
Santa Barbara	0	0	0	0	0	2	0	0	1	2	<1
Ventura	0	0	0	0	1	0	0	0	0	0	<1
Total	***1255***	***1243***	***1122***	***1059***	***1143***	***1176***	***1065***	***933***	***904***	***950***	***1085***

Source: California Department of Fish & Game PacFIN Report (Sacramento, CA office)

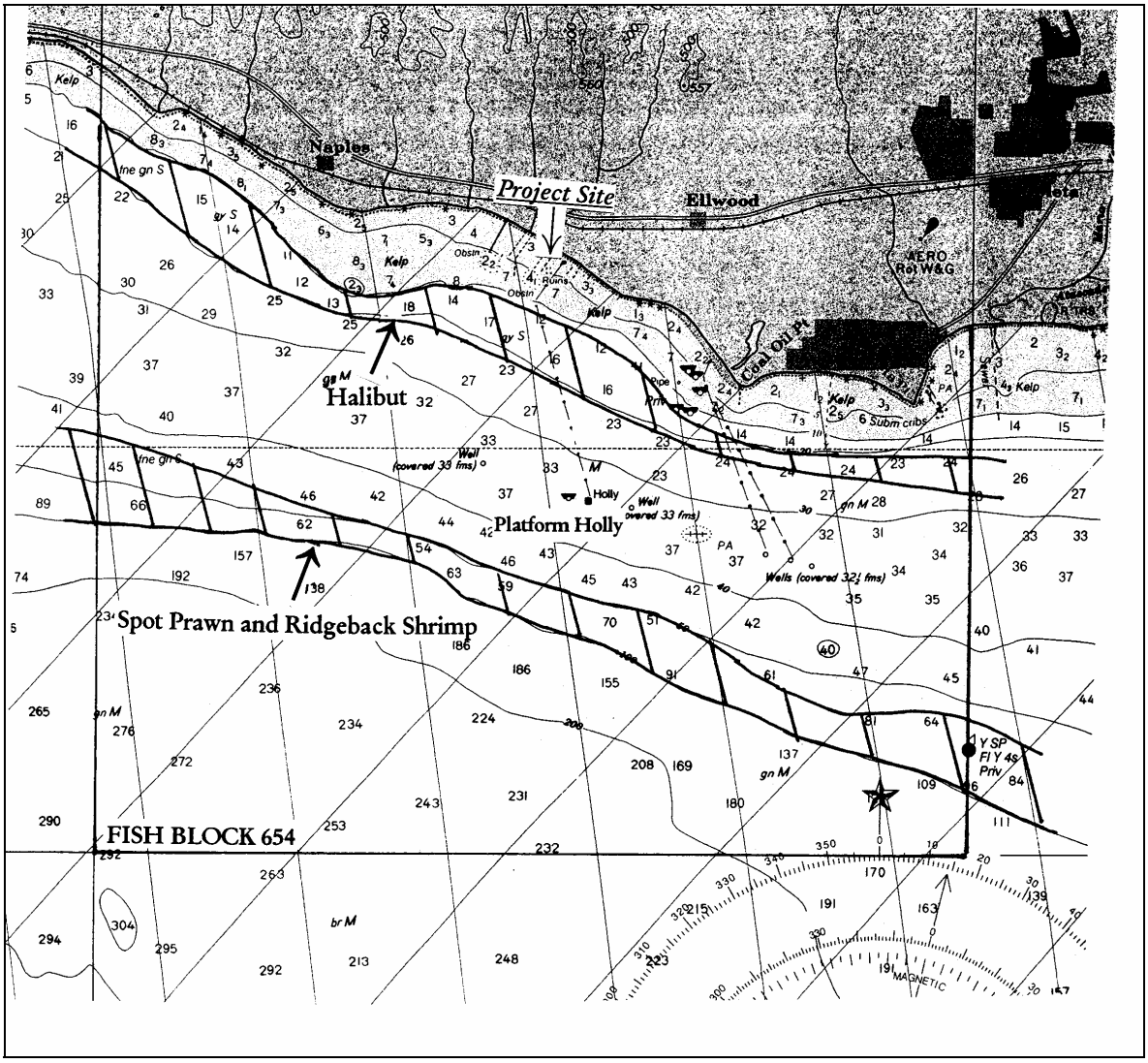

Figure 4.4-1. California Department of Fish & Game Fish Block No. 654

Commercial species most likely targeted in the nearshore areas (water depths of 60 ft [18 m] or less) are urchins, crab, and lobster. Seining for squid and bonito could occur within that area, but would be most common beyond the outer edge of the kelp and in areas where there are no seafloor hazards. Halibut trawling is allowed within the 3-mile (4.8 km) limit in this area (from Pt. Dume to Pt. Arguello), and is also most common in water depths of 60 ft (18m) or more. Commercial trap buoys were observed within the kelp immediately to the east and west of the exposed pier platform during the two biological surveys conducted in March and April 2001.

Table 4.4-3. Annual Catch (pounds) of Five Most Abundant Commercial Species from Fish Block 654 (1989-1999)

1989	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*
Urchins (D)[1] 47,038	Urchins (D) 45,573	Urchins (D) 90,648	Urchins (D) 145,633	Urchins (D) 82,182	Urchins (D) 83,341	Squid (SE) 189,609	Urchins (D) 123,546	Urchins (D) 155,537	Urchins (D) 67,717	Ridgeback Shrimp (Tr) 130,779
Rock Crab (S) 2,213	Halibut (S) 4,427	Rock Crab (S) 18,828	Bonito (SE) 42,899	Cucumber (Tr) 48,835	Squid (SE) 29,982	Urchins (D) 134,739	Ridgeback Shrimp (Tr) 17,103	Crab (T and Tr) 26,753	Ridgeback Shrimp (Tr) 21,584	Cucumber (Tr) 45,779
Lobster (T) 1,620	Lobster (T) 1,543	Ridgeback Shrimp (Tr) 11,218	Crab (S) 22,068	Bonito (SE) 43,211	Cucumber (Tr) 13,550	Salmon (Tro) 72,352	Crab (T) 14,322	Lobster (T) 21,494	Lobster (T) 15,441	Urchins (D) 35,437
Halibut (S) 655	Cucumber (Tr) 1,500	Halibut (S) 5,430	Halibut (S) 11,976	Crab (T and S) 9,375	Ridgeback Shrimp (Tr) 12,884	Lobster (T) 15,695	Lobster (T) 12,784	Ridgeback Shrimp (Tr) 20,309	Cucumber (Tr) 9,720	Lobster (T) 6,764
Angel shark (S) 307	Rockfish (D and S) 1,347	Lobster (T) 4,103	Lobster (T) 4,392	Halibut (S) 8,192	Crab (T) 11,327	Cucumber (Tr) 14,744	Spot Prawn (Tr) 2,976	Cucumber (Tr) 6,720	Crab (T and Tr) 9,023	Halibut (S) 2,957
Total All Species										
53,445	58,172	139,718	236,453	209,659	178,956	472,425	187,149	245,856	131,253	231,819

[1]D=dive, T=trap, Tr=trawl, SE=seine, S=set net, Tro=troll

Seasonal restrictions exist for commercial fishing for lobster and urchins, and may vary from year to year. Lobsters are fished in the winter and spring; the 2003 lobster season is from September 27 2003, through March 17, 2004. There are no closed commercial seasons for the *Cancer* crab species (*productus, anthonyi,* and *antennarius*) within this area; however, fewer crab traps might be expected during lobster season when crab fishers tend to target on lobster (M. Larson, pers. comm.). The open season for urchins is more variable: the months of January through March, and November and December; most weekdays in April, May, June, August, September, and October. July has the fewest open days (7), all of which are Mondays and Tuesdays.

Birds

Over 195 species of seabirds use the open water, shore, and island habitats in the SBC (NOAA 2000). Over 2.5 million seabirds may pass through or reside in the area at any one time. Based on aerial and ship surveys, average seabird densities in the open water areas of the SBC are between 90 and 125 birds per square mile (1.6 km^2) (MMS 1993 cited in USN 2000). The marine avifauna population in the SBC fluctuates seasonally because the area is located along the Pacific Flyway. Few species remain in the area throughout the year since most are non-breeding transients (U.C. Santa Cruz 1978). The seasonal distribution of some of the more abundant coastal birds is summarized in Table 4.4-4. In a study conducted for the Minerals Management Service (Varoujean *et al*. 1983), bird transects off Coal Oil Point encountered all the species noted in Table 4.4-4 (except for the Common Murre). Birds readily

observed in the vicinity of, and roosting and nesting on, the remnant island structure of the pier are brown pelicans, gulls, and cormorants (see Figures 3-5 and 3-6).

Table 4.4-4. Seasonal Distribution of Coastal Seabirds in the Project Area

Winter	Spring	Summer	Autumn
Pacific loon*	Pacific loon*		Pacific loon*
	Sooty shearwater	Sooty shearwater	Sooty shearwater
	Red-necked phalarope		Red-necked & Red phalaropes
Cassin's auklet			Cassin's auklet
Common murre	Common murre		Common murre
		Pigeon guillemot	
	Xantus' murrelet	Xantus' murrelet	
Western & Clark's** grebe	Western & Clark's** grebe		Western & Clark's** grebe
	Brandt		
Surf scoter	Surf scoter		
Brown pelican	Brown pelican	Brown pelican	Brown pelican
Brandt's cormorant	Brandt's cormorant	Brandt's cormorant	Brandt's cormorant
Pelagic cormorant			
Double crested cormorant	Double crested cormorant	Double crested cormorant	Double crested cormorant
Forster's tern			
		Elegant tern	Elegant tern
California gull	California gull	California gull	California gull
Western gull	Western gull	Western gull	Western gull
Mew gull			
Bonaparte's gull	Bonaparte's gull		Bonaparte's gull
Heerman's gull	Heerman's gull		

Source: Dohl et al. 1983; National Geographic Society 1987; NOAA 2000.
* Formerly called Arctic Loon
** Formerly combined as Western Grebe

Marine Mammals

Thirty species of cetaceans (baleen and toothed whales) occasionally visit, migrate through, or inhabit the SBC and/or the SCB. At least nine species generally can be found in the area in moderate or high numbers either year-round or during annual migrations into or through the area. These include Dall's porpoise, Pacific white-sided dolphin, Risso's dolphin, bottlenose dolphin, short-beaked and long-beaked common dolphins, northern right whale dolphin, Cuvier's beaked whale, and gray whale (USN 2000). Their seasonality and habitat preferences are provided in Table 4.4-5. In addition, sightings of Humpback and Blue whales in the SBC have

become more common in recent years. The common dolphins, white-sided dolphin, and Pacific bottlenose dolphin, are permanent residents of the region (BLM 1981). Other cetacean species, such as the Gray whale, migrate past and through the SBC. Often, Gray whales swim less than 0.5 mi (0.8 km) from shore.

Table 4.4-5. Seasonality and Habitats of Cetaceans Found in the Santa Maria Basin/SBC

Species	Seasonality	Habitat Preferences
Dall's porpoise	Year-round resident, peak numbers in autumn/winter. Low numbers in summer.	Continental shelf, slope, and offshore; prefers deep waters.
Pacific white-sided dolphin	Year-round resident with N-S movements to colder-water areas in late spring and summer.	Continental shelf, slope, and offshore: water < 17°C. May occur very near shore in spring-summer, south of Point Conception
Risso's dolphin	Year-round resident, peak in winter, low numbers in summer.	Mostly offshore, recently over continental shelf. May occur very near shore during summer-autumn.
Bottlenose dolphin	Year-round resident. No seasonal peak.	Coastal: Within 0.5 mi (0.8 km) of shore. Offshore: Continental shelf, slope, and offshore waters.
Short-beaked common dolphin	Summer resident.	Coast to 300 mi (480 km) or farther from shore. Usually not very nearshore in Santa Barbara region.
Long-beaked common dolphin	Year-round resident, peak numbers in summer.	Coast to 50 mi (80 km) from shore. Usually not very nearshore in Santa Barbara region.
Northern right whale dolphin	Resident in winter and spring, peak numbers in winter.	Continental slope; water 8-19°C
Cuvier's beaked whale	Unknown, historically perhaps fall-winter.	Pelagic
Gray whale	Southbound migration Dec.-Feb., peaking in late Dec.-Jan.; northbound Feb.-May, peaking in March.	Mostly coastal but offshore routes are used near Channel Islands. Tends to be closer to shore during northbound migration.

Source: USN 2000, Bonnell and Daily 1993.

The four most common species of pinnipeds inhabiting the SBC are the California sea lion, northern fur seal, harbor seal and the northern elephant seal (BLM 1981). The adult breeding population of pinnipeds is estimated at 32,000 individuals, and 20,000 young are born each year. The harbor seal is the most common pinniped in the project area. A significant harbor seal pupping and haulout area exists along the Naples area east of the Ellwood Pier approximately 4,400 feet (1,340 m) west of the project site. Haulout areas for California sea lion are located at Goleta Point and the University of California Santa Barbara lagoon located about

3.5 mi (6km) east of the project site (USCG & OSPR 2000). The other abundant pinniped likely to be seen around PRC-421 area is the California sea lion, which use beaches in the vicinity of Bell Canyon Creek east of Ellwood Pier and at Goleta Point (USCG & OSPR 2000) as haulouts.

The California portion of the Stellar sea lion population, which breeds as far south as Año Nuevo Island near Monterey Bay (two historic rookery locations on San Miguel Island have not been occupied since the 1982-83 El Niño event [NOAA 2000]), has recently been listed as threatened. A sixth species, the Guadalupe fur seal, occasionally appears in the summer in the breeding grounds of the resident sea lions and northern fur seals on San Miguel Island and occasionally elsewhere in the SBC. The NOAA Fisheries (National Marine Fisheries Service) has listed the Guadalupe fur seal as a threatened species (NMFS 1985).

The established habitat range of the southern sea otter does not extend into the SBC at the present time as described on the CDFG web site (January 2004). However, a year-round presence of sea otters has been established in Cojo Bay. Although it is not an established habitat, there have been more frequent sightings of the southern sea otter further south and east into the SBC in recent years, including isolated sightings in the areas of Coal Oil Point and Ellwood Pier.

4.4.1.3 Endangered, Threatened, and Other Listed Species

All the marine mammals discussed above are protected under the Marine Mammal Protection Act. Some of the species that may occur in this area are also listed under the Endangered Species Act (ESA) as Endangered (sperm whale, blue whale, fin whale, humpback whale, northern right whale) or Threatened (Steller sea lion, Guadalupe fur seal, Southern sea otter).

Several of the bird species potentially occurring within the project site and surrounding beach habitat areas have been afforded protected status by the State and/or federal governments due to declining populations and habitats. Known nesting sites are identified near the project site and on the Channel Islands, and there is a potential for special status bird species to forage within the project site; special status bird species are discussed in greater detail below. It should be noted however, that only the California least tern and California brown pelican feed offshore.

California least tern (*Sterna antillarum browni*) is designated as "Federal Endangered," "California Endangered," and "California Fully Protected." The California least tern is a migratory species and arrives in California breeding territories in late April and is present through August. This species forages within estuaries, lagoons, and nearshore waters where small fish are abundant. Prey consists of anchovy, silversides, and shiner surfperch, two of which are among the top three species in abundance throughout the SBC. The terns are present at nesting colonies from April through August (with nesting occurring in mid-May and June), in areas containing open, sandy, or gravelly shores that are barren to sparsely vegetated, located near shallow-water feeding areas, and are relatively free of human or predatory disturbance. This species abandons nesting areas readily if disturbed. Courtship typically occurs at beaches near the nesting colonies (Zeiner *et al*. 1990).

California brown pelican (*Pelecanus Occidentalis*) is listed as "Federal Endangered," "California Endangered," and "California Fully Protected." Brown pelicans roost on the mainland or islands using beaches, mudflats, rocks, wharfs, or jetties. Brown pelicans use the PRC 421 remnant structure as a day roost and probably as a night roost. However, it's use is influenced by a population of Brandt's cormorants, which use the site for nesting. Nonetheless, the pier is considered by the California Department of Fish and Game (CDFG) as the only secure roost site in Santa Barbara County south of Point Conception (Strong, 2002a,b). Generally, these pelicans are identified as having a moderate level of site fidelity (USGS 2004). This species forages in early morning or late afternoon within estuarine, subtidal, and open ocean waters and feeds almost entirely on fish and crustaceans that are caught by diving from a distance of 20-40 ft (6-12 m) above the water surface. This species is common along the Southern California coast from June to October and can be regularly seen feeding within the offshore and nearshore portions of the project site. This species breeds on the Channel Islands (Anacapa, Santa Barbara, and Santa Cruz) from March to early August. Following the breeding season, individuals leave the breeding colonies and disperse along the California and Mexico coastlines, with some small numbers visiting the Salton Sea and Colorado River reservoirs (Zeiner et al. 1990).

Elegant tern (*Sterna elegans*) is listed as a "State Species of Special Concern," and may be found at coastal areas within Humboldt County and Marin County south to Baja California. This species congregates on beaches and tideflats when not feeding, and forages on fish primarily within shallow ocean waters beyond the surf zone. This species was initially a rare and irregular post-nesting visitor to California, but numbers have been increasing since the 1950s, and large flocks can now be seen. Breeding primarily occurs within Mexico and extreme southern California. During 1959, a colony was established at San Diego Bay. This colony has persisted, and may have facilitated the species' range extension into the central coast of California (Zeiner *et al*. 1990).

Double-crested cormorant (*Phalacrocorax auritus*) is classified as a "State Species of Special Concern". This species occurs throughout most of North America, including coastal areas from Alaska to Baja California and various inland areas. The double-crested cormorant is a yearlong resident along the entire coast of California. From August to May, the species is fairly common to locally very common along the coast and in estuaries and salt ponds, uncommon in marine subtidal habitats from San Luis Obispo County south, and very rare to the north (Zeiner et al. 1990). Double-crested cormorants require undisturbed nest-sites beside water, on islands or the mainland. This species usually nests on wide rock ledges on cliffs, rugged slopes, and live or dead trees, especially tall ones. This species feeds mainly on fish, but also on crustaceans and amphibians. The species dives from the water surface and pursues prey underwater, usually remaining submerged for about 30 seconds. This species prefers water less than 30 ft (9 m) deep with rocky or gravel bottom, but may catch fish as deep as 72 ft (22 m). This species sometimes feeds cooperatively in flocks of up to 600, often with pelicans. The double-crested cormorant breeds mostly during the months of April to July or August, and lays their eggs in April to June. Breeding birds typically use the same colony and nesting location year after year (USGS 2004). Numbers of double-crested cormorants are declining throughout North America (Zeiner *et al*. 1990).

Western snowy plover (*Charadrius alexandrinus nivosus*) is classified as "State Species of Special Concern" and "Federal Threatened." This subspecies of snowy plover occurs at beaches within Washington, Oregon, California, and Mexico (Baja California). Western snowy plover require sandy, gravelly, or friable soil substrates for nesting, using a shallow depression in which to lay eggs. The species is present at nesting sites from April through August (Zeiner et al. 1990). Nesting at historic nesting sites (coastal sandy beaches) has declined due to human disturbance. Western snowy plover are preyed upon by gulls, ravens, coyotes, and skunks. This species relies on camouflage for cover, and often crouches motionless on sandy substrate (Zeiner *et al*. 1990). During the breeding season, adults generally do not wander far from the nest (Zeiner *et al*. 1990). Western snowy plover feed by gleaning insects and amphipods from the dry sand of upper beaches, and may occasionally forage in wet sand for sand crabs. The US Fish and Wildlife Service has designated several beaches along the Pacific Coast as Critical Habitat for this species (USFWS 1999). One such area is Devereaux Beach, located less than 2 mi (3 km) down coast from PRC-421.

Long billed curlew (*Numenius americanus*) is designated as a "State Species of Special Concern." This species is uncommon to very common along the California coast from early July to early April, and can be found in a variety of habitats including coastal estuaries, upland herbaceous areas, and croplands. While feeding, this species uses its long bill to probe into soft substrate, or to grab prey from the surface. Prey consists of mud crabs, ghost shrimp, mud shrimp, insects (larvae and adults), clams, small estuarine fish, worms, spiders, berries, crayfish, snails, small crustaceans, and occasionally nestling birds. Long-billed curlew breed within wet meadow habitat in northeastern California during the months of April to September (Zeiner *et al*. 1990).

California gull (*Larus californicus*) is designated as a "State Species of Special Concern." This species is an abundant visitor to coastal and interior lowlands during the non-breeding season (mid-August to mid-April), and may be found in a variety of local habitats including sandy beaches, mudflats, rocky intertidal, pelagic areas, fresh and saline emergent wetlands, lakes, rivers, cropland, landfills, and open lawns within urban areas. This omnivorous species feeds on garbage, carrion, earthworms, insects (adults and larvae), brine shrimp, and young birds. This species nests in colonies at alkali and freshwater lacustrine habitats east of the Sierra Nevada and Cascade ranges (Zeiner *et al*. 1990).

Light-footed clapper rail (*Rallus longirostris levipes*) is listed as "Federal Endangered," "California Endangered," and "California Fully Protected." This sub-species is found from Santa Barbara County to San Diego County, and prefers emergent wetland and brackish emergent wetland dominated by pickled, cordgrass, and bulrush. Light-footed clapper rail requires shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water. Along the coast, prey consists of crabs, mussels, clams, snails, insects, spiders, mice, and worms. Breeding occurs from March through July in saline wetlands. The loss of emergent wetland habitat has contributed to the decline in numbers of this species in recent decades. Due to the lack of emergent wetland and tidal mudflats at the project site, this species is not expected to occur within the onshore portions of the project site, but may occur at Devereaux Slough located east of the project site, just west of Coal Oil Point (Zeiner *et al*. 1990).

Steelhead (*Oncorhynchus mykiss*). The Southern California Evolutionary Significant Unit (ESU) of steelhead is listed as a "Federal Endangered" species (NMFS 1997). This ESU was geographically defined as ranging from the Santa Maria River in San Luis Obispo County to Malibu Creek in Los Angeles County. A range extension to San Mateo Creek in northern San Diego County has subsequently been proposed (NMFS 2000a).

Steelhead were historically common to most streams California (NMFS 1999). They hatch in fresh water, descend to the ocean, and return to fresh water to spawn. Depending on the stream, steelhead can be either summer or winter migrators but regardless of migration period, spawning usually takes place from March to early May (Love 1991). Because of inhospitable conditions in the lower reaches of southern California streams, steelhead in this region usually spend less time in fresh water than they do further north. They may migrate to the ocean or have greater dependency on coastal lagoons during the first year. Fish movements, both upstream and downstream, coincide with flow pulses from storms because these coastal streams are characterized by sand bar build up at the mouth during low flow summer months (NMFS 2000b). Local upcoast streams that have been identified as having historical or present use by steelhead or as having good steelhead habitat, include Ellwood Canyon Creek, Tecolote Creek, Eagle Canyon Creek, and Dos Pueblos Canyon Creek. Down coast, several of the drainages that feed into Goleta Sough have excellent habitat and are used by steelhead.

The **tidewater goby** (*Eucyclogobius newberryi*) is listed as "Federal Endangered" and a "State Species of Special Concern". This small (2 inches [5 cm]) fish inhabits brackish waters of lagoons and lower stream reaches in California. It has a wide salinity tolerance range, from fresh water to marine. The tolerance for high salinity allows dispersal and colonization of new lagoons and estuaries following flushing during storm events. As a result of review of new information, the USFWS has determined that populations north of Orange and San Diego Counties are not threatened with endangerment and has proposed removal of the northern populations from the endangered species list (USFWS 1999).

Bocaccio (*Sebastes paucispinis*) is a species of rockfish that is presently a candidate species for listing under the federal ESA. At present, it has no protection status under the ESA. Bocaccio adults are commonly found in waters of 250 to 750 ft (76 to 230 m) over a somewhat irregular, hard or rubble bottom. Young bocaccio 1 or 2 years old travel in loose schools and move into shallow water. This species is designated as overfished under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Bocaccio are a typical long-lived and slow-growing rockfish, and stock rebuilding for bocaccio is heavily dependent on single large year classes. A rebuilding plan for this stock has been adopted by NMFS (2000)

Although rarely encountered, **sea turtles** occur within waters off the southern California coast, and as such, could potentially occur within the project site. Populations of marine turtles have been greatly reduced due to over-harvesting and loss of nesting sites in coastal areas. In the eastern Pacific, most of the turtles nest along the coasts of Mexico and Central America. The nesting season varies with species, but is generally from May to September. Sea turtles breed at sea; and the females return to their natal beaches to lay their eggs. Female turtles can

nest several times in a season but at two to three-year intervals. The eggs, after being laid in the sand, hatch in about two months; and the young instinctively head for the sea (MFS Globenet Corp./WorldCom Network Services 2000). The four listed sea turtles that may occur within the project area include: Green sea turtle, Pacific Ridley sea turtle, Leatherback sea turtle, and Loggerhead sea turtle. General distribution and species information is provided below.

Green sea turtles (*Chelonia mydas*) are a "Federal Endangered" species occurring worldwide in waters above 68° F (20° C) (MFS Globenet Corp./WorldCom Network Services 2000; USN 2000). Green sea turtles have been reported as far north as Redwood Creek in Humboldt County and off the coasts of Washington, Oregon, and British Columbia (NOAA 2000; MFS Globenet Corp./WorldCom Network Services 2000; USN 2000). The green sea turtle is thought to nest on the Pacific coasts of Mexico, Central America, South America, and the Galapagos Islands. There are no known nesting sites along the west coast of the U.S., and the only known nesting location in the continental U.S. is on the east coast of Florida (MFS Globenet Corp./WorldCom Network Services 2000; USN 2000). Green sea turtles are sighted year-round in marine waters off the southern California coast, with the highest concentrations occurring during July through September (USN 2000). Green sea turtles are herbivores, feeding on algae and sea grasses (MFS Globenet Corp./WorldCom Network Services 2000), but also eat fish and invertebrates, e.g., sardines, anchovies, jellies, mollusks, worms, etc., (MFS Globenet Corp./WorldCom Network Services 2000; USN 2000).

Pacific Ridley sea turtle (*Lepidochelys olivacea*) is a "Federal Endangered" species distributed worldwide and is regarded as the most abundant sea turtle in the world. Within the east Pacific, the normal range of Pacific Ridley sea turtles is mainly from Baja California to Peru (NOAA 2000; MFS Globenet Corp/WorldCom Network Services 2000; USN 2000). However, they have been reported as far north as Washington, Oregon, and are a rare visitor to the California coast (MFS Globenet Corp/WorldCom Network Services 2000). Major nesting beaches are located on the Pacific coasts of Mexico and Costa Rica (MFS Globenet Corp/WorldCom Network Services 2000). The population on Pacific beaches in Mexico has declined from an estimated 10 million adults in 1950 to less than 80,000 in 1983 due to excessive over-harvesting (NOAA 2000; MFS Globenet Corp/WorldCom Network Services 2000). The Pacific Ridley sea turtle is omnivorous, feeding on fish, crabs, shellfish, jellyfish, sea grasses and algae (NOAA 2000; MFS Globenet Corp/WorldCom Network Services 2000; USN 2000), and may dive to considerable depths (80 to 300 m [260 to 980 ft]) (USN 2000).

Leatherback sea turtle (*Dermochelys coriacea*) is listed as "Federal Endangered" and have been sighted as far north as Alaska and as far south as Chile (NOAA 2000; MFS Globenet Corp./WorldCom Network Services 2000; USN 2000). Their extensive latitudinal range is due to their ability to maintain warmer body temperatures in colder waters (MFS Globenet Corp/WorldCom Network Services 2000). Leatherback sea turtles are omnivores, but feed principally on soft prey items such as jellyfish and planktonic chordates, e.g., salps (NOAA 2000; MFS Globenet Corp/WorldCom Network Services 2000; USN 2000).

The population of leatherback sea turtles in the eastern Pacific is estimated at 8,000 nesting females and is concentrated in western Mexico, Central America, and northern Peru.

No nesting occurs within U.S. beaches (MFS Globenet Corp/WorldCom Network Services 2000).

Leatherback sea turtles are the most common sea turtle off the west coast of the U.S. (USN 2000; NOAA 2000). Off the U.S. west coast, leatherback turtles are most abundant from July to September. Their appearance coincides with the yearly establishment of the 64.4 to 68° F (18 to 20° C) isotherm (around the month of July). In addition, it has been noticed that their appearance off the U.S. west coast is "two pronged" with sightings occurring in northern California, Oregon, Washington, and southern California, with few sighting occurring along the intermediate coastline. In southern California waters, leatherback turtles are most common during the months of July through September, and in years when water temperatures are above normal (USN 2000).

Loggerhead sea turtles (*Caretta caretta*) are listed as "Federal Threatened" and primarily occur in subtropical to temperate waters and are generally found over the continental shelf (MFS Globenet Corp/WorldCom Network Services 2000). Loggerhead sea turtles are omnivorous and feed on a wide variety of marine life including shellfish, jellyfish, squid, sea urchins, fish, and algae (MFS Globenet Corp./WorldCom Network Services 2000; USN 2000; NOAA 2000).

The eastern Pacific population of loggerhead sea turtles breeds on beaches in Central and South America. Southern California is considered to be the northern limit of loggerhead sea turtle distribution (MFS Globenet Corp/WorldCom Network Services 2000). However, loggerhead sea turtles have stranded on beaches as far north as Washington and Oregon (NOAA 2000; MFS Globenet Corp/WorldCom Network Services 2000; USN 2000). In addition, in 1978, a loggerhead sea turtle was captured near Santa Cruz Island in southern California (MFS Globenet Corp/WorldCom Network Services 2000). Loggerhead sea turtle abundance in southern California waters is higher in the winter during warm-water years than cold-water years. However, during the summer months (July through September) abundance is similar in warm and cold years. Juvenile loggerhead turtles may be encountered year round in southern California waters, while the occurrence of adult loggerhead turtles in southern California waters is rare at any time of the year (USN 2000).

White abalone (*Haliotis sorenseni*) was listed as a "Federal Endangered" species effective June 28, 2001. White abalone is the deepest-living of the west coast *Haliotis* species, occurring from 66-197 ft (20 to 60 m). Their maximum size is 10 inches (25.2 cm) with an average of 5-8 inches (13-20 cm). They reach sexual maturity at an age of 4 to 6 years (3.4-5.2-inches [88-134 cm]) in size, and have an estimated maximum life span of 35 to 40 years. Abalone release millions of eggs or sperm in a spawning event. Fertilized eggs develop into free-swimming, non-feeding larvae, before metamorphosing into the adult form after 5 to 14 days (9-10 days for white abalone in the laboratory). Young abalone seek cover (are "cryptic") in rocky habitats and feed on benthic diatoms, bacterial films and single-celled algae. As they grow and become less vulnerable to predation they emerge and feed on attached and drifting algae. Historically, white abalone ranged from Point Conception to Punta Abreojos, Baja California. Present estimated population is 1,600 to 2,500 individuals. Pre-exploitation population estimates exceed 2,000,000 animals (NMFS 2001).

California Fish and Game NDDB

According to a query conducted in January 2004 of the California Natural Diversity Database (2003) for the Dos Pueblos 7.5 minute quadrangle, tidewater goby is the only species discussed above that occurs near the project site, and which may actually enter the project site. Tidewater goby have been identified at the lagoons of Tecolote Canyon and Eagle Creek. The lagoons for each of these streams are located approximately 3,000 and 8,000 ft (914 and 2438 m), respectively, to the northwest of the remnant pier structure. None of the sensitive avifaunal species listed above are identified by the CNDDB within this area.

The CNDDB listed two sensitive beetle species that inhabit the beach dunes along this portion of the Santa Barbara County coastline. The sandy beach tiger beetle (*Cicindela hirticollis gravida*) inhabits clean, dry, light-colored sand in the upper zone of beach dunes. Subterranean larvae prefer moist sand not affected by wave action. The sandy beach tiger beetle was observed at Coal Oil Point in 1979. The globose dune beetle (*Coelus globusus*) inhabits coastal sand dune habitats, commonly burrowing beneath the sand surface and dune vegetation of foredunes and sand hummocks and was identified at Haskell's Beach in 1987 (California Department of Fish & Game 2003).

Two sensitive plants were also identified as occurring within the coastline of this portion of Santa Barbara County. They are black-flowered figwort (*Scrophularia atrata*) and Contra Costa goldfields (*Lasthenia conjugens*). The black-flowered figwort is found in coastal dunes and coastal scrub. Contra Costa goldfields are endemic to verbal pools and associated habitats.

USCG 2000 Area Contingency Plan

Several of the threatened or endangered species mentioned above may occur offshore, nearshore, or onshore within the vicinity of areas that have been identified by MMS oil spill modeling as having the potential for being contacted by an oil spill if one occurred at this site. The Area Contingency Plan (ACP) (USCG & OSPR 2000) identifies those locations where these species may occur. Although the chance for a crude oil spill (for which the spill model run was conducted) is negligible for the Proposed Project, the potential for fuel spills from work vessels must be considered, especially with its proximity to shore. The relevant ACP locations and species present are listed in Table 4.4-6, which can be referenced to the map in Figure 4.4-2.

Table 4.4-6. Resources of primary concern for the shoreline areas along the mainland California coast and Santa Barbara Channel Islands that were identified as potentially affected if an offshore release occurred. Taken form 2000 Area Contingency Plan (ACP) (Section 4600), which should be consulted for more detail.

MMS Land Segment No.	ACP Map No.	Site No.	Site	Marine Mammals	Birds	Intertidal Resources/ Wetland Biota/Other	Seasonal Concerns
53	101	A-4-014	Gaviota Creek	Harbor Seals, Calif. Sea Lions, Elephant Seals, Sea Otters	Brown Pelicans, other seabirds, shorebirds, & waterfowl	Wetland biota including Steelhead Trout and Tidewater Goby.	Whenever the creek mouth is open to the ocean (much of year, depending on rain): Wetland biota including Steelhead Trout and Tidewater Goby, waterfowl, and saltwater & freshwater marsh habitats. All year: seabirds, shorebirds, waterfowl, Harbor Seals.
52	102	A-4-017	Refugio Creek	Sea Otters	Shorebirds, seabirds, and waterfowl	Wetland biota including Tidewater Goby	Whenever the creek mouth is open to the ocean (late Fall - early Summer, depending on rain): Wetland biota All year: seabirds.
		A-4-018	El Capitan Creek	None identified	Brown Pelicans, seabirds, shorebirds	Wetland biota	Whenever the creek mouth is open to the ocean (late Fall - early Summer, depending on rain): Wetland biota.
51	103	A-4-019	Naples	Harbor Seals Sea Otters	None identified	Grunion, poss. Pismo Clams	Jan. - June: Harbor Seals pupping & breeding. Spring & Summer high tides: Grunion spawning. All Year: High conc. Harbor Seals.
		A-4-074	Eagle Canyon Creek	Sea Otters	None identified	None identified	Whenever the creek mouth is open to the ocean (rainy season): Wetland biota.

Table 4.4-6. (Continued)

MMS Land Segment No.	ACP Map No.	Site No.	Site	Marine Mammals	Birds	Intertidal Resources/ Wetland Biota/Other	Seasonal Concerns
		A-4-020	Tecolote Creek	Sea Otters	Brown Pelicans, seabirds, shorebirds, & waterfowl	Wetland biota including Steelhead Trout and Tidewater Goby	Whenever the creek mouth is open to the ocean (late Fall - early Summer, depending on rain): Wetland biota.
		A-4-075	Bell Canyon Creek	Calif. Sea Lions Sea Otters	Brown Pelicans, seabirds, shorebirds, & waterfowl	Wetland biota including Steelhead Trout and Tidewater Goby, waterfowl & marsh vegetation.	Whenever lagoon mouth is open or subject to high tide washover.
		A-4-021	Devereaux Slough	Sea Otters	Snowy Plovers, Least Terns	Wetland biota incl. waterfowl & vegetation	Whenever slough is open to ocean, typically only during heavy rainfall.
50	104	A-4-022	Goleta Point & Campus Lagoon	Calif. Sea Lions, Sea Otters	Brown Pelicans, seabirds, shorebirds, & waterfowl	Grunion, Eel Grass beds	Spring & Summer: grunion spawning. All year: Calif. Sea Lions, Eel Grass beds, shore & wading birds, gull, Brown Pelicans.
		A-4-023	Goleta Beach	None identified	Brown Pelicans, poss. Snowy Plovers, seabirds, & shorebirds	Grunion	Spring & Summer: grunion spawning.
		A-4-024	Goleta Slough	None identified	Brown Pelicans, Belding's Savannah Sparrow, seabirds, shorebirds, & waterfowl	Wetland biota incl. Salt Marsh Bird's Beak, Steelhead Trout.	Feb. - June (depending on persistence & magnitude of flows): Steelhead Trout run pass through slough.
		A-4-025	More Mesa/ Goleta Rocks	Harbor Seals	Brown Pelican	None identified	Jan. - June: Harbor Seals pupping and breeding. All year: Harbor Seal haul out.

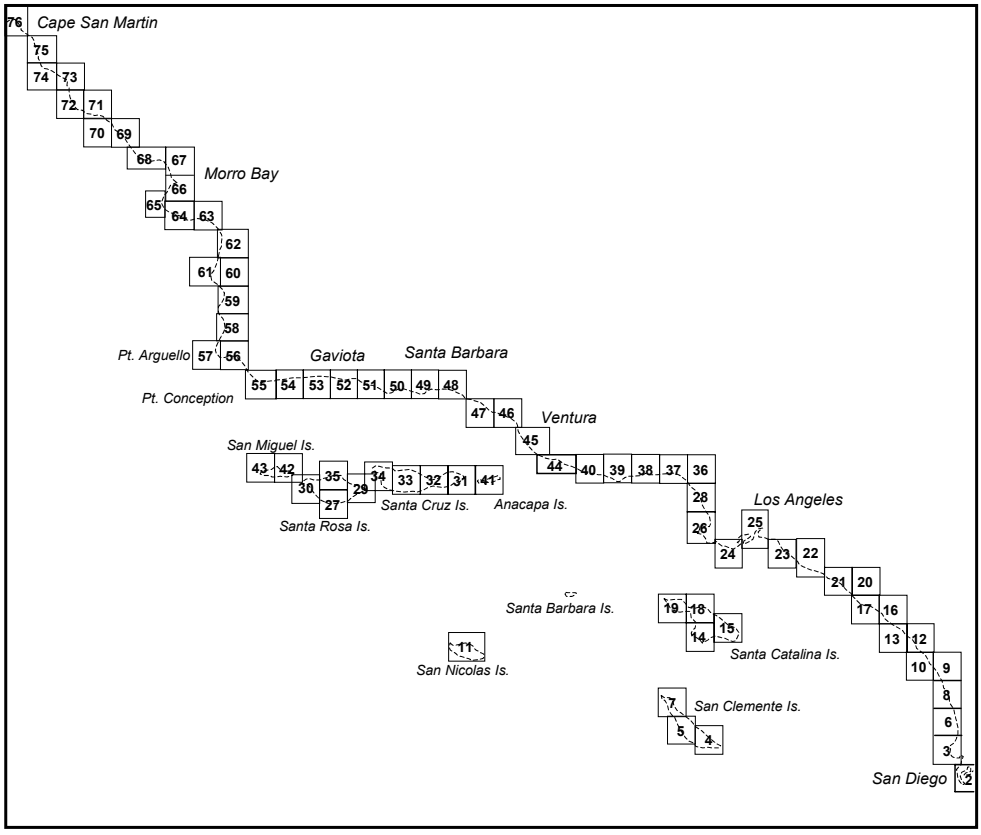

Figure 4.4-2. Southern California Coastline with MMS (2000) Grid Identifying Specific Land Segments

4.4.1.4 Marine Biological Resources

Centaur (1984) characterizes the regional nearshore habitats (water depths <120 ft [36.6 m]) as a mixture of rock outcrops and sediment. That report indicates that rocky substrate is limited to water depths of approximately 45 ft (14 m) or less, with sedimentary substrate in deeper water. The habitats and marine biological resources within the area were described by Chambers Consultants and Planners (1985) as part of an EIR for ARCO's proposed Coal Oil Point Project, comprising two new offshore platforms and oil pipelines to the Ellwood area. Utilizing literature and field data, Chambers described the inter- and subtidal marine habitats and biota from Gaviota to Santa Barbara, including those within PRC-421. Diver-biologist surveys along the three proposed pipeline routes (Ellwood Pier, Corral/Las Flores Canyons, and the Aminoil Marine Terminal) indicated that kelp was present at the Ellwood and Corral/Las

Flores sites with densities ranging from 0.03 to 0.10 per m^2. During the dives from -40 ft (-12 m,) to shore, Chambers (1985) found that the kelp density along the Ellwood route "…was much sparser…" and there were "…fewer rocks…" than at the Corral/Las Flores site. Another large brown alga, Desmarestia munda, was also common at the Ellwood site. Common kelp-associated fish along the Ellwood route included senoritas (Oxyjulis californica), kelp bass

(Paralabrax clathratus), pile perch (Damalichthys vacca), and kelp fish (multiple genera), (Chambers 1985).

4.4.2 Site-Specific Setting

On March 20, April 17, and August 2, 2001, L.A. de Wit, a marine and coastal environmental sciences consultant, conducted diver-biologist surveys of the ten proposed offshore anchor locations and anchor line corridors to the previously proposed vessel locations, and the waters adjacent to the remnant pier structure. Four of those anchor locations (A1, -4, -5, and -10) and anchor line corridors are proposed for use for the Proposed Project. In addition, L.A. de Wit and his team conducted above-water visual surveys of the project area, including reconnaissance of the remnant pier structure and adjacent kelp beds (see Figure 4.4-3 through 4.4-6). The following summarizes the marine biological resources and habitats within the region (Coal Oil Point to Ellwood Pier) and project site. The discussions are based on literature and site-specific field data, including side scan sonar and the above-mentioned diver-biologist observations from the site.

Within the project site, side scan sonar records (Appendix F) from a survey conducted in March 1999 (Fairweather Pacific 2000) showed the seafloor in water depths of $\geq$20 ft ($\geq$6) m to generally comprise a mixture of sediment and rock with the sedimentary substrate most common to the west of the remnant pier and rocky outcrops to the east of that structure. "Thick kelp" was present on rocky substrate, precluding the survey vessel from collecting data in some site areas. Utilizing onboard differential GPS the surficial kelp at the site was plotted during the March 2001 L. A. de Wit biological survey. The results of that plotting are shown in Figure 4.4-3.

The March, April, and August 2001, diver-biologist surveys included observations at the then-proposed 10 anchor locations, along anchor line corridors to the proposed vessel locations, and around the remnant pier (see the map in Appendix I for the original anchor locations and survey areas). As described previously, four of the anchor locations surveyed during the 2001 biological study (A-1, -4, -5, and -10) correspond to those in the revised Project Description (see Figure 4.4-3). The Proposed Project may need to install one or two temporary mooring buoys, which would be located up coast of the project site out of kelp areas. Because the locations have not yet been determined, no diver-biologist surveys have yet been completed for the two temporary mooring buoys.

As shown in Figure 4.4-3, and as discussed in Table 4.4-7, diver observations found that the rocky substrate extends offshore (south) and east of the exposed platform with isolated solid substrate inshore (north). Most of the rock is in water depths of 40 ft (12 m) or less. The surficial kelp mapped during the March 2001 biology survey generally corresponds to the rocky substrate; the thickest surface kelp was found in water depths of approximately 30 ft (9 m) or less.

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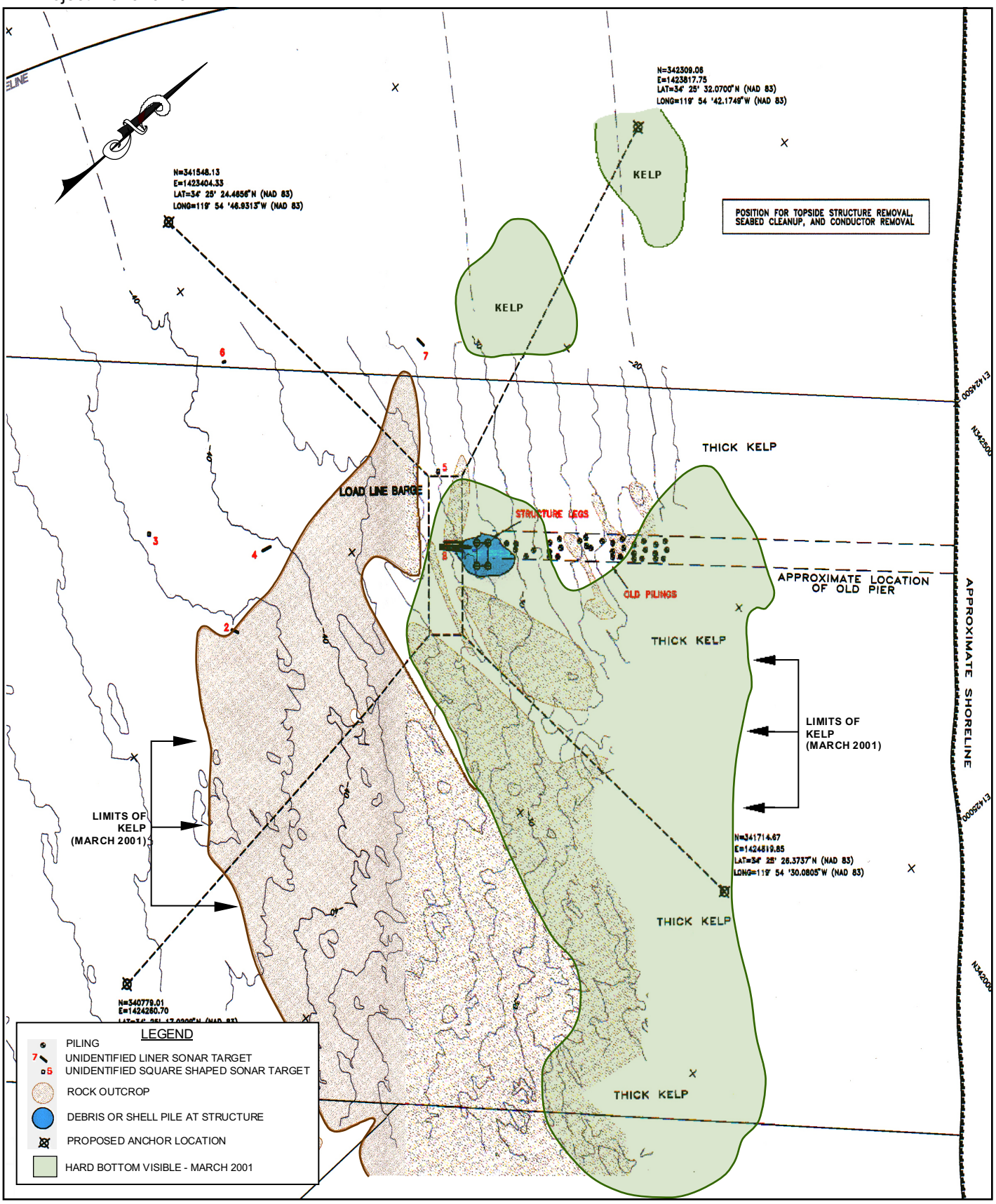

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SURFICIAL KELP
FIGURE 4.4-3

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Two of the four proposed anchor locations (A-1 and A-4) are located in sediment; a spot check of anchor A-5 indicates it is located on rock and the habitat at A-10 is mixed sediment and rock. Diver-biologist observations along the offshore anchor corridors (A-1 and A-4) reveals that the sediment is replaced by low (<0.5 ft [< 0.15 m]) to moderately high (3 ft [0.9 m]) rock ledges at about the 40-ft (12.2 m) isobath. The rock substrate continues along these corridors with some sedimentary areas immediately offshore of the exposed pier-platform in water depths of approximately 30 ft (9 m).

Table 4.4-7. Diver Observations at Anchor Sites

Anchor Corridor[1]	Habitat and Dominant Epibiota
A-1 (Southeast Anchor)	Sediment to 42 ft (12.8 m) (*Diopatra, Kelletia*, and sea pens common; rock ridges with red and purple urchins (*Strongylocentrotus fransicanus* and *S. purpuratus*), *Kelletia, Parapholas*, and *Corynactis* common. One kelp bass (*Paralabrax clathratus*); sediment patch at 35 ft (10.7 m).
A-4 (Southwest Anchor)	Sediment to 38 ft (11.6). Low relief rock ridges with isolated sediment patches to 35 ft (10.7 m). Common rock epibiota: kelp, *Cystoseira, Pterygophora*¸ both species of urchins, and *Aglaophenia*. *Diopatra* common in sediment patches.
A-5 (Northwest Anchor)	Low relief, sand-covered rock ridges grading into sand. Coralline algae present, *Cystoseira* and *Egregia* present to common; kelp abundance estimated at 1 plant per 25 ft^2 (2.3 m^2).
A-10 (Northeast Anchor)	Sand and scattered 3 ft-high (0.9 m-high) boulders grading into 3 ft-high (0.9 m-high) rock ridges. Kelp common (1 plant per 10 ft^2 [0.9 m^2) with *Egregia*, *Desmarestia*, and *Cystoseira* present to common. Algal cover 30 to 50% of rock ridges. *Pisaster brevispinus* present on sand-covered lower-relief rock ridges at offshore end of transect.

[1] Anchor designations, e.g., A-1, etc. were given to anchor locations for the original project because there were 10 of them as shown on figures included in Appendix I, Dive and Surface Observations.

The habitat along the two inshore anchor corridors (A-5 and A-10) is mixed sand and rock; the latter consisting of boulders and 1 to 3 ft (0.3 to 0.9 m) high exposed bedrock ridges. Common rock-associated algal taxa, which covered up to 50% of the low-relief ridges, included giant kelp (*Macrocystis* sp.), *Cystoseira osmundacea*, *Egregia laevigata*, and a red alga *Rhodymenia* sp.; coralline algal species were also present but not common. *Macrocystis* abundance was estimated to be 1 plant per 10 ft^2 (1.1 per m^2) within the nearshore anchor corridors where rock was present. Kelp abundance was substantially lower where boulders or lower-relief, sand-covered ridges were present. Other common epibiota included sea stars (*Pisaster brevispinus* and *P. giganteus*), and a solitary tunicate, *Styela montereyensis*. Table 4.4-7 summarizes the habitat and biota along the four offshore anchor corridors.

In general, diver observations confirmed the substrate types recorded during the 1999 side scan sonar survey (Appendix F). The rock substrate in the offshore areas consists of low to moderate-relief ridges. Red and purple urchins (*S. franciscanus* and *S. purpuratus*) were particularly abundant on the rock ledges in the offshore areas. Kelp was present on most of the rocky substrate in water depths of 35 ft (10.7 m) or less but the only anchor line corridor in which it was abundant was along the southeastern corridor. Two other brown algal species (*Desmarestia* and *Cystoseira*) were also common, being most abundant in the shallower

portions of the corridors. Sea stars *Pisaster giganteus*, *P. ochraceus*, and *Asterina* (= *Patiria*) *miniata*, and the red colonial gorgonian coral *Lophogorgia chilensis* were also present, but not abundant on the rocky substrate.

The habitat along the inshore anchor corridors is predominantly rock (low- to high-relief ridges and isolated boulders), although isolated sand patches are more prevalent in within the northwest (A-5) corridor. Kelp was common to abundant within the two inshore (north) anchor corridors with a maximum estimated abundance of 0.2 per yd^2 (0.3 per $m^{2)}$. Macroepibiota within the nearshore areas was similar to that found offshore, although urchins were less common and no gorgonian corals were observed within the inshore anchor corridors.

Diver-biologists surveyed and took still photographs and video of the habitats, macrobiota, and fish associated with the eight concrete caissons and exposed steel, and seafloor at and around the remnant pier. The upper portions of the caissons support relatively thick aggregations of mussels (*Mytilus* spp.) interspersed with the brown alga *Egregia* sp. and occasional kelp plants and anemones, including *Anthopleura* sp. The ochre sea star, *Pisaster ochraceus* was common on the mussel band. At approximately -10 ft (-3 m), the *Mytilus* band was replaced with the strawberry anemone *Corynactis californica* and the tube-building mollusk *Serpulorbis squamigerus* that covered the caissons from -10 ft (-3 m) to the seafloor in approximately 33 ft (10 m) of water. The feather duster worm, *Eudistylia* sp., was also present within this band. Around the base of the pilings was an area of shell talus, comprising mostly *Mytilus* shells, which supported a relatively abundant population of sea stars. The solitary tunicate *Styela montereyensis* was common to abundant on the lower portions of the pilings. Juvenile kelp plants were observed on the pilings and adult plants were present on the steel and isolated rocks around the bases of the pilings.

The pile-associated ichthyofauna comprised surf perches including the pile perch (*Damalichthys vacca*), black perch (*Embiotoca jacksoni*), and white perch (*Phanerodon furcatus*); sheephead (*Pimelometopon pulchrum*); and kelp bass (*Paralabrax clathratus*). Two species of rockfish (*Sebastes auriculatus* and *S. atrovirens*) were also observed in the water column above the shell talus. An estimated 50 individual fish were observed during the survey of the remnant pier.

Water Surface Survey

During the same March, April, and August 2001, surveys described above, biologists conducted surveys of the remnant pier structure and the adjacent water and above-water areas adjacent to the structure. Figure 4.4-4 displays photographs taken during these surveys showing the presence of several avifaunal species. The following observations were noted (Table 4.4-8).

Although pelicans, cormorants, and gulls were present during all surveys, no nesting birds were observed during the August survey. As described above, kelp beds grow in approximately the same places as hardbottom habitats, and were observed during these above-water surveys. Figures 4.4-5 and 4.4-6 display photographs of kelp beds adjacent to the remnant pier structure taken on March 20 and April 17, 2001, respectively.

(**A**) March 20, 2001 Photograph. Note that Cormorant nests are not yet present.

(**B**) April 17, 2001 Photograph. Cormorant nests are present in left portion of photograph.

PRESENCE OF AVIFAUNAL SPECIES ON PRC-421 PIER REMNANT
FIGURE 4.4-4

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(**A**) View looking southwest from approximately 500 feet. Photograph taken March 20, 2001.

(**B**) View looking southwest from approximately 75 feet. Photograph taken March 20, 2001.

PRESENCE OF KELP BEDS ADJACENT TO PRC-421 PIER REMNANT
FIGURE 4.4-5

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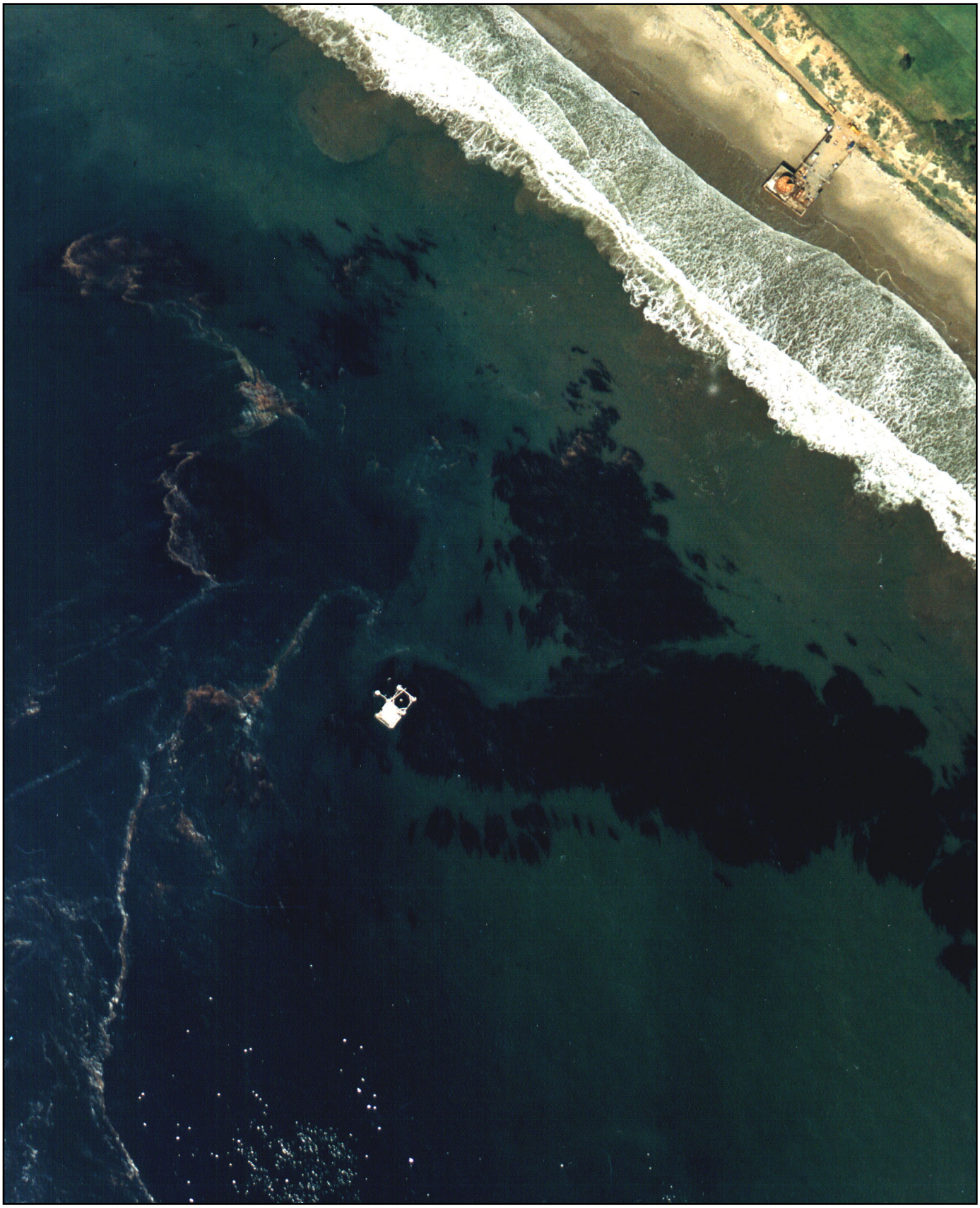

SOURCE: Pacific Western Aerial - Photo Taken April 17, 2001

PRESENCE OF KELP BEDS
ADJACENT TO PRC-421 PIER REMNANT
FIGURE 4.4-6

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Table 4.4-8. Above-water Observations at the Project Site

Birds	March 20, 2001*	April 17, 2001	August 9, 2001
Gulls	Common	(Data not available)	Common (> 5 individuals)
Brown pelicans	Common	Estimated 20 individuals, not appearing to be nesting	Approximately 25 individuals. No nesting.
Cormorants	Abundant (not identified to species)	Estimated 30-35 individuals with 7 nests observed on the south and west-facing portions of the pier platform. (Double crested, Brandt's, and pelagic cormorants, nests unconfirmed)	Estimated approximately 100 individuals. No nesting.
Western grebes	Present to abundant	(Data not available)	None present.
Cliff swallows	(Data not available)	Estimated 35-40 individuals nesting in/on steel support structure of the platform	None present.
Pigeons	Common	Estimated 5 individuals	None present.
	*Present = 3-5 individuals; Common = 6-10; Abundant = >10		
Kelp			
The surface kelp was healthy and thickest immediately to the east of the platform. Smaller patches were observed to the west and immediately south of the pier platform. Kelp was thick during both dates. (Please refer to Figure 4.4-3)			
Other Observations			
At least two commercial crab/lobster trap marker buoys were observed near the pier platform and within the anchoring area			

Source: L.A. de Wit Survey Notes (Appendix I)

4.4.3 Regulatory Framework

Biological resources are protected by a number of local, State and federal statutes, regulations and rules. Several different agencies are responsible for monitoring these regulations including, but not limited to, the U.S. Fish and Wildlife Service (FWS), NOAA Fisheries (National Marine Fisheries Service [NMFS]), Environmental Protection Agency (EPA), California Department of Fish and Game (CDFG), California Coastal Commission (CCC) and California State Water Resources Board (SWRB). The following is a brief summary of legislation and policies applicable to the protection of biological resources in the project vicinity.

4.4.3.1 Local Policy

The Santa Barbara County Local Coastal Plan (1982) requires that proposed projects be consistent with its policies that are designed to protect coastal resources. Although the

Proposed Project is located outside the jurisdictional boundary of the County's Local Coastal Plan, the County recommends that State and federal agencies with jurisdictional authority ensure the project activities are consistent with established local, State and federal policies. In particular, the LCP requests that "*State and federal agencies carefully monitor activities that may affect marine water quality…*"

4.4.3.2 State Policy

Biological resources in the project vicinity are protected in the State of California by statutes and policies included in the California Endangered Species Act, the California Coastal Act, and in the Fish and Game Code. The following is a brief description of regulations included in those acts that apply to the Proposed Project.

California Endangered Species Act

The California Endangered Species Act (Fish and Game Code section 2050 *et seq.*) recognizes the importance of endangered and threatened fish, wildlife and plant species and their habitats. Sections 2052-2098 of the Fish and Game Code "prohibit the "taking" of any endangered, threatened, or rare plant and/or animal species unless specifically permitted for education or management purposes" (Resource Insights 1999).

California Coastal Act

The California Coastal Act of 1976 provides for the long-term protection of California's coastline to maintain and enhance coastal resources. Section 30230 states the "*marine resources shall be maintained, enhanced and where feasible, restored*." The maintenance of the biological productivity and the quality of coastal water to maintain optimum populations of marine organisms is required under section 30231 (Resource Insights 1999).

Fish and Game Code

There are additional regulations contained in the Fish and Game Code that apply to the Proposed Project and are not included in any of the above listed acts. The following is a summary of applicable regulations (Resource Insights 1999).

Section 1700:

> It is the policy of the state to encourage the conservation, utilization and maintenance of ocean biological resources under their jurisdiction for the public's benefit. The state will also promote the development of local and distant-water fisheries based in California under international law. Objectives include the maintenance of populations of all species of aquatic organisms to insure their continued existence and support reasonable use.

Sections 1755 and 1801:

> It is the policy of the state to maintain sufficient populations of all species of wildlife and native plants and the habitat necessary to ensure their continued existence for the

beneficial use and enjoyment of the public. In addition, all species of wildlife and native plants will be perpetuated for their intrinsic and ecological values, as well as for their direct benefits to man.

Sections 3511 and 4700:

Fully protected birds and/or mammals or parts thereof may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected bird and/or mammal and not such permits or licenses heretofore issued shall have any force or effect for any such purpose.

4.4.3.3 Federal Policy

Biological resources in the project area are federally protected by the following laws: Endangered Species Act, Coastal Zone Management Act, Migratory Bird Treaty Act, Marine Mammal Act, and the Clean Water Act. The following is a brief description of regulations included in those acts that apply to the Proposed Project.

Endangered Species Act

No person subject to U.S. jurisdiction may "take" listed endangered or threatened species within the U.S., its territorial seas, or on high seas.

Coastal Zone Management Act

The Coastal Zone Management Act declares that it will be the national policy to: *"(1) preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations; and (2) encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological values."* Programs should provide for *"the protection of natural resources, including wetlands, flood plains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone."*

Migratory Bird Treaty Act

The Migratory Bird Treaty Act states that *"it is unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill…any migratory bird, any part, nest, or eggs of any such bird…included in the terms of the conventions between the United States and Great Britain for the protection of migratory birds concluded August 16, 1916 (39 Stat. 1702), the United States and the United Mexican States for the protection of migratory birds and game mammals concluded February 7, 1936, and the United States and the Government of Japan for the protection of migratory birds and birds in danger of extinction, and their environment concluded March 4, 1972."*

Marine Mammal Protection Act

It is unlawful for any person subject to the jurisdiction of the United States or any vessel or other conveyance subject to the jurisdiction of the United States to "take" any marine mammal on the high seas. "Take" is defined to include harassment as well as hunting, killing, and capturing. The 1994 amendments to the MMPA further define harassment as *"any act of pursuit, torment, or annoyance which has the potential"* to (A) *"injure a marine mammal or marine mammal stock in the wild",* or (B) *"disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering*." Sections 101 and 102 of the MMPA prohibit intentional killing or harassment of marine mammals, but allow incidental contact in the course of normal vessel operations.

Clean Water Act

Additional criteria for significance have been identified from the section 404(b)(1) of the Clean Water Act pertaining to dredged or fill materials. Although this project does not involve dredging or filling of material, the possibility of increasing the turbidity of the waters in the vicinity of the pier structure is a potentially significant impact. These criteria include the following:

- In regards to threatened or endangered species, smothering, impairment or destruction of the habitat to which the species is limited. These include water quality, spawning, and rearing areas, cover, food supply, salinity, circulation patterns, and physical removal of habitat.
- A reduction in food web organisms by exposure to contaminants, promoting undesirable competitive species at the expense of indigenous species, smothering, exposure to high levels of suspended particles, destruction of spawning grounds and elimination of the lower trophic levels.
- Damage to or destruction of habitats resulting in adverse effects on the biological productivity of wetland ecosystems by smothering organisms, altering hydrology, modifying substrate elevations, altering periodicity or water movement, causing successional change in vegetation, reducing nutrient exchange capacity, and altering current velocity.
- Loss of values of recreational and commercial fisheries including harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man.
- Degrading water quality by obstructing circulation patterns.

4.4.4 Impacts and Mitigation Measures

Biological issues associated with Proposed Project activities include loss of manmade roosting/nesting structure for marine birds and high-relief solid substrate habitat for marine biota, i.e., the pier structure; noise and percussive impacts associated with explosives use to

marine mammals, birds and fish; vessel traffic disruption of migration and other activities or colliding with marine mammals; hardbottom impacts due to anchoring of the derrick barge and associated support vessels; loss of kelp bed habitat for fish; impacts to wildlife from hydrocarbon-based fuel spills from work vessels; increases in suspended sediment from project activities; and potential impacts to commercial and recreational fishing.

4.4.4.1 Methodology

Information on the status and sensitivities of the biological resources in the project study area were obtained from the biological surveys conducted in March, April, and August 2001 (please refer to Section 4.4.6), a review of existing literature, interviews with local experts and consultations with regulatory agencies. The list of special status-species and sensitive habitats that have the potential to be affected by the Proposed Project were derived by the above-stated biological surveys, a search of the California Natural Diversity Database (NDDB 2001), USCG 2000 Area Contingency Plan, various CEQA documents of nearby projects, and by consultations with regulatory agencies.

4.4.4.2 Significance Criteria

Pursuant to the CEQA, significant effects that may occur to biological resources are identified in Appendix G of the CEQA, the Environmental Checklist Form. If the Proposed Project would result in impacts to the following resources, these impacts may be considered significant:

- Impacts to endangered, threatened, or rare species or their habitats (including, but not limited to plants, fish, insects, animals, and birds);
- Locally designated species;
- Locally designated natural communities;
- Wetland habitat; or
- Wildlife dispersal or migration corridors

In keeping with the regulatory framework for the Proposed Project, impact analysis for biological resources is based on thresholds of significance related to the laws, statutes, and regulations that are listed above.

Significant adverse fisheries related impacts are defined as those that:

- Substantially interfere with commercial or recreational fishing for more than one month during open fishing season;
- Preclude trawling within a substantial area where it would otherwise be permitted;
- Substantially increase the area of untrawlable seafloor for more than one season;
- Substantially increase the exposure of commercially or recreationally fished species to toxic substances; or

- Cause substantial losses of commercially or recreationally fished species or their habitats.

4.4.4.3 Project Impacts on Biological Resources

Short-term Impacts. The following are the potential impacts occurring during the demolition, recovery and construction phase of the Proposed Project.

BIO-1: The detonation of underwater explosives to topple pier columns, driving of pilings to support the nesting platforms, and deposition of quarry rock will increase noise levels and associated percussive impacts in the project area, possibly affecting marine mammals, birds, and fish.

Discussion:

The second phase of the Proposed Project is sequential detonation of explosives attached to pier caissons to topple caissons A1-A3, B1-B3, and C1-C2. Noise associated with the second phase will include airplane and vessels conducting pre-detonation wildlife surveys, detonation of the explosives (four, 1.8-lbs. charges per column), and noise associated with DSV winches to move from the determined explosion area.

Sound is perceived by receivers (animal or mechanical/electronic) as a function of their sensitivity to sound pressure, which is measured in micropascals (µPa) (1 pound/in^2 [psi] = 0.00689 µPa). Since hearing is a non-linear response, acousticians have adopted a logarithmic scale, decibels (dB), for sound intensities. These two measurements are related as follows:

$$\text{Sound Pressure Level (dB)} = 20 \log(P/P_0)$$

where P_0 is the reference pressure (1 µPa for underwater sound) (Greene 1995). Additional information on the behavior of underwater sound and its measurement can be found in Appendix J-*Wildlife Protection Plan*.

Animals, e.g., marine mammals, may be affected by sound in different ways depending upon its intensity. There may be behavioral changes as simple as a startle response to more complex changes such as a change in breathing rate or change in direction of travel. Stronger intensities can result in temporary or permanent hearing loss (TTS [temporary threshold shift] or PTS [permanent threshold shift]). Still stronger intensities ("shock waves") can result in tissue and organ damage (eardrum rupture at the low end) or death. Damage tends to occur at boundaries between tissues of different densities. Gas-containing organs, e.g., lungs, gastrointestinal tract, gas bladders, are especially susceptible (Richardson 1995c).

In the regulations implementing the Marine Mammal Protection Act of 1972 (50 CFR part 216), two levels of harassment are defined: Level A in which an injury may occur, e.g., hearing damage, and Level B in which a disruption of behavioral patterns may occur. Under certain conditions the NOAA Fisheries can authorize the taking of small numbers of marine mammals (50 CFR part 214, subpart I). While Level A harassment is theoretically permittable, NOAA Fisheries usually will only issue an Incidental Harassment Authorization (IHA) if steps are taken

to avoid this level of harassment. Based on published studies and past projects using underwater explosives, the NMFS has preliminarily determined that marine species can be safely exposed to sound pressure levels not greater than 182 dB and 12 lb/psi-msec (whichever is more protective for the species) (NOAA Fisheries 2001).

Underwater explosions produce a positive acoustic impulse (a measure of magnitude and duration) that can result in organ injuries or death. Empirical studies (see Table 4.4.9) (Yelverton et al. 1973) and subsequent models (Hill 1978; Young 1981) to describe safe distances from blast damage have been summarized by Richardson and Malme (1995) and Keevin and Hempen (1997).

It has been previously calculated that the Proposed Project-related blast impulse could attenuate down to 0.005 psi-s (= 5 psi-msec) 400 ft (122 m) from the detonation (mud-buried blast, *Explosive Methodology & Analysis*-Appendix L. Open-water blast attenuates to 12 psi-msec at a distance of 500 ft [152 m]). This is a safe level as determined by the study of Yelverton et al. (1973) (see Table 4.4.9). More recently, NOAA Fisheries (2001) has preliminarily determined that an impulse level of 12 psi-msec is safe for marine mammals.

Table 4.4-9. Underwater Blast Criteria of Medium-Sized Mammals Held under Water (from Yelverton et al. 1973)

Equivalent measures of impulse		Criteria
40 psi-msec	276 Pa-s	High incidence of moderately severe blast injuries, including eardrum rupture. No Mortality.
20 psi-msec	138 Pa-s	High incidence of slight blast injuries, including eardrum rupture.
10 psi-msec	69 Pa-s	Low incidence of trivial blast injuries. No eardrum ruptures.
5 psi-msec	35 Pa-s	Safe level. No injuries.

Some safe-range models incorporate depth of detonation and depth of target mammal (Hill 1978). Young's (1981) simplified model is considered to be more reliable because it depends on the body mass of the receiver, and predicts safe ranges based on the worst combination of blast depth and mammal depth, and therefore produces conservative estimates of safe ranges (Richardson and Malme 1995). Young's equation is as follows:

$$R = cM^{0.28}$$

where: R = the safe range (m),
C = a body mass constant,
M = charge mass (kg).

The resulting safe ranges calculated for different sizes of marine mammals exposed to a 7.2 lb (2.69 kg) charge, the size to be used in the Proposed Project, is presented in Table 4.4.10.

Table 4.4-10. Safe Ranges for Different Sizes of Marine Mammals.

Marine Mammal	Body mass constant	Charge M	Safe Range R	
	c	(kg)	(m)	(ft)
Dolphin calf	220	2.687	290	952
Dolphin adult	165	2.687	218	714
Small whale, 6 m	124	2.687	164	537

Prior to detonation of any of the caissons at PRC-421, a 1,000-yd (914-m) hazard zone will be surveyed by boat, and a buffer zone beyond 1,000 yd (914-m) by aircraft, to ensure that no marine mammals are present in the hazard zone (See *Wildlife Protection Plan*-Appendix J. This distance is over three times the range considered to be safe even for a dolphin calf (see Table 4.4.10).

In 1998, explosives were used in the demolition of the Mobil Seacliff Pier, about 30 miles (48 km) downcoast from PRC-421. In that project (using the internal method of column severing in contrast to the external method used here) 112 lbs (50.8 kg) of explosives were used on the 8-ft (2.4-m) diameter caissons. Other blasting, with larger amounts of explosive, was done on larger caissons, but only the results on the 8-ft (2.4-m) caissons are provided here for comparison. In 6 separate blasts, a wide range of sound pressure levels (SPL) were recorded at 1,000 yds (914 m) from the source: 177, 186, 202, 199, 177, and 201 dB (Howorth 1998). Given that only 7.2 lbs of explosive will be used on each of the PRC-421 8-ft (2.4-m) caissons, the 1,000-yd (914-m) SPL for this project is expected to be much lower.

The *Wildlife Protection Plan* (Appendix J) will be followed to ensure that no protected species are within 1,000 yds. (914 m) of the detonations. Based on modeling results and the data from the Seacliff Pier experience, it is expected that, if there are no marine mammals in the 1,000-yd (914 m) hazard zone at the time of detonation, no injuries will occur to any marine mammals. SPLs at the 1,000-yd (914 m) boundary are expected to be less than 180 dB, but some Level B harassment may occur to marine mammals outside, but near the hazard zone.

Keevin and Hempen (1997) summarize several studies on the effects of underwater explosions on fish and mammals and provide recommended mitigations to reduce the impacts to these resources. That summary indicates that, in general, high velocity explosives produce an abrupt rise time, high amplitude, and short frequency waveform and a higher negative pressure than low velocity explosives such as black powder. It is the rapid change in pressure that usually is responsible for impacts to fish, with juveniles and species with swim bladders being more susceptible to impacts than adults and species without swim bladders.

The 7.2-lbs (3.3 kg) of explosive used at each caisson is expected to produce an overpressure of 80.8 psi (5.5 atmospheres [558 kPa]) within 30 ft (9 m) of the detonation point. Studies cited in Keevin and Hempen (1997), found that similar pressures produced by

detonating a 2-kg charge of T-100, a high explosive, in open water, killed 12 to 36 percent of bluegill, a freshwater fish, caged at various distances from the explosion in 6.6 ft (2 m) of water. The results of those experiments indicated that an LD_{50} (the distance at which 50 percent of the bluegill would be killed from the open-water detonation of a 2 kg high explosive ranged between 125 and 131 ft (38 and 40 m). It is important to note that the Proposed Project will utilize slightly larger charges but they will not be in open-water but below the mudline, resulting in lower pressures within the water column as some of the effects of the detonation will be absorbed by the seafloor material.

Ogawa, *et al.* (1978) and Teleki and Chamberlain (1978), cited in Keevin and Hempen (1997) found that physoclistic species (swim bladder attached to the circulatory system) were more sensitive to blasting than physostomus (swim bladder attached to the esophagus) species. Other studies indicate that while the capability to equilibrate pressure relatively rapidly aids in fish survival, most explosive over and underpressures occur too quickly for fish to adapt. Yelverton *et al.* (1975), cited in Keevin and Hempen (1997) found that a higher impulse is required to kill larger fish (body weight) than small fish. It is therefore likely that small fish and those species with swim bladders that are within approximately 130 ft (40 m) of the detonation would be most susceptible to the effects of the underwater explosions.

Although there is some disagreement, sources cited in Keevin and Hempen (1997) indicate that bubble curtains reduce the effects of explosives on fish. Studies on the effectiveness of an air bubble curtain in reducing explosive pressures and associated kill radius on bluegill indicate peak pressures, impulse, and energy flux density were reduced from 81 to over 99 percent with the bubble curtain (Keevin, *et al.* [in press] cited in Keevin and Hempen [1997]). Other studies cited in Keevin and Hempen (1997) have shown a statistically significant reduction in the number of fish killed and/or a decrease in the diameter of the area where 50 percent of the fish were killed when bubble curtains are used.

Data from the Seacliff Pier demolition indicates that the average number of fish killed for each detonation was 108, most were surfperches. This level of mortality was considered to be quite low, especially when compared to a similar project in the region where fish mortalities of were considered low (Howorth 1998). The Seacliff Pier demolition project involved the demolition of a number of caissons ranging from 8- to 22-feet (2.4 m to 6.7 m) in diameter and the amount of explosives required for each caisson ranged from 187 lbs. to 337 lbs (82.8 kg to 152.9 kg). At PRC-421, divers will survey the pier area prior to detonation to ensure that there are not large quantities of fish present in the immediate vicinity.

Observations by Marine Mammal Consulting Group (MMCG) during the Seacliff Pier demolition revealed that fish kills attracted birds and marine mammals to the project area. These animals were seen scavenging on injured or dead fish in between each blast (Howorth 1998), thereby increasing their risk of injury and delaying the established detonation schedule. It was for these reasons that a change in the caisson demolition process was made at Seacliff Pier. By demolishing the caissons in sets instead of individually, wildlife entering the project area afterward to feed on any fish injured or killed by a detonation were not subject to further risk (Howorth 1998). This change also significantly reduced the total time span of the detonation procedure by minimizing the delay time in between each detonation.

Prior to detonation, birds will be flushed from the PRC-421 structure according to the *Wildlife Protection Plan* (Appendix J) to prevent mortality or injury to roosting birds, especially cormorants and brown pelicans. Diving seabirds are at risk from the explosion if they are nearby, underwater, at the time of detonation. The experience at the Seacliff Pier demolition indicates that mortality to diving birds will be quite low. Two birds that had escaped detection (a scoter and a cormorant) were killed (Howorth 1998). The survey and flushing activities described in the *Wildlife Protection Plan* should also clear the area of most diving birds as well.

As described in the *Wildlife Protection Plan* (Appendix J) the noise produced by pile driving in water depends on several factors and, based on studies of similar operations a 160 dB re: 1μPa - rms was considered safe by regulatory agencies for baleen whales. Studies summarized in Battelle (1987) suggest that no rockfish startle responses were observed from air gun-generated noise levels below 200 dB re: 1μPA although the threshold for fish alarm responses was about 180 dB re: 1μPA. The data provided in that report indicate that while some fish startle response could occur during the pile driving, the impacts to fish generated by the noise from those activities is short term and insignificant. Fish are expected to return to the waters around the pilings shortly after the completion of pile driving activities and no long term effects of the noise are expected.

As described in the *Wildlife Protection Plan* (Appendix J), the placement of quarry rock will produce low frequency sounds that could result in extremely localized Level B harassment of marine mammals. The sounds would be transmitted through the water as the rocks slid across the deck of the barge, splashed into the water and landed on the sea floor. Such sounds would be localized and short-lived because the rock will be placed in three days.

To eliminate or reduce the impacts of these activities, the following measures, which have been revised based on reviews by NOAA Fisheries and CDFG biologists, have been incorporated into the Proposed Project plan (from Applicant's 2003 Permit Application, see Appendix J of this EIR, *Wildlife Protection Plan,* as additional measures are provided in the Plan):

- The project will be timed to avoid California gray whale migration (November 30th to June 1st).
- Marine mammal monitors will be onsite to monitor activity of mammals through the project area. The monitor will fly aerial line transects over the project area in an airplane to survey for marine mammals that may be impacted by the explosions. These transects will involve an area from the beach to 4 mi (6.4 km) offshore and 4 mi (6.4 km) to either side of the project site. The aircraft will fly approximately east to west, paralleling the shoreline, along a line plotted in advance. The aerial line transects will be spaced approximately ¼ mile (0.4 km) apart. Shipboard line transect surveys will also be conducted consisting of lines a quarter of a mile (0.4 km) apart, staggered between the aerial lines. Shipboard lines will extend to one mile (1.6 km) on either side of the project and one mile (1.6 km) offshore. Two vessels will be used, each starting at opposite ends of the transect grid and one starting inshore while the other starts offshore. Each boat will carry an

observer/recorder and one observer on each side of the vessel. Total survey coverage of the project area will consist of 1/8 mile (0.2 km) transect spacing within one mile surrounding the project, and ¼ mile (0.4 km) transect spacing between one and four miles from the project. Once the area is surveyed the principal marine mammal monitor will give approval prior to each detonation of explosives. The aircraft will continue circling the project site during each detonation

- Once both the aerial and shipboard line transect surveys have been completed, the boats will patrol a hazard zone with a radius of 1,000 yards (914 m), and the aircraft will patrol an additional buffer zone to ensure that no protected wildlife is likely to enter the hazard zone.
- Two observers will be stationed onshore to ensure adequate coverage of the surf zone, which is inaccessible to monitoring vessels. One observer will select a vantage point close to the project site but slightly eastward, while the other will be stationed on Ellwood Pier. As an alternative to the Ellwood Pier location, an observer may be stationed on the coastal bluff just west of the site.
- If any birds remain roosting on the structure and do not respond to warning signals, a detonation cap will be fired to frighten them away for their own safety.
- As much as practicable, a berm made of jetted material shall be built up on the seaward side of the columns. This will help reflect and absorb some of the energy of the detonation.
- All charges shall be set below the mudline of the seafloor.
- All eight sets of charges shall be detonated in rapid succession to avoid repeated risks associated with separate detonation events.
- The seaward sets of charges shall be detonated first so the bubbles and mass of columns will help reduce sound pressure levels from subsequent detonations.
- Detonations of charges shall be staggered to avoid a build-up of sound pressure levels.
- The demolition contractor shall not deviate from the explosives plan as specified in the Project Description.
- The aircraft and one boat will continue surveying the hazard and buffer zones for one-half hour after detonation of the charges to ensure that no protected species escaped detection and were injured. In the unlikely event that an animal is injured, it would be captured by approved *Marine Mammal Consulting Group* (MMCG) personnel and taken to the nearest approved wildlife care facility.
- Power to the pile driver shall be ramped up prior to driving each pile. This will warn marine wildlife by gradually increasing the underwater noise level.
- The same monitoring methods and hazard zone as described for the explosive detonations shall be employed during pile driving operations, except that these operations may continue until sunset.

- A concrete-decked barge shall be used for the quarry rock. This will reduce the noise associated with moving quarry rock across steel barges.
- Prior to beginning the placement of quarry rock each day or each time a new load of quarry rock is ready, a land-based monitor shall make certain that no marine mammals are present within 500 feet (152 m) of the project site.]

As discussed in Section 4.3, vessel traffic will occur throughout all phases of the Proposed Project as vessels will navigate to and from the project site before, during, and after the removal operations, and during the pre-detonation boat surveys. It is for this reason that a *Marine Mammal Contingency Plan* (MMCP) was completed to assist personnel in avoiding the harassment or injury of marine mammals (please refer to Appendix L) while operating any of the vessels. This MMCP has been reviewed and revised by NOAA Fisheries and CDFG staff biologists. As described in the Applicant's Permit Application (2003), personnel involved in the structure removal operations will be familiar with the procedures outlined in the MMCP, and will implement the following protection measures:

To eliminate or reduce the impacts of these activities, the following measures have been incorporated into the Proposed Project:

- Although the project will be timed to avoid whale migration seasons; nevertheless, gray whales and other cetaceans could be present during the work period. Avoidance of marine mammals will be achieved by observing the following rules:
  1. Support vessels will not cross directly in front of migrating whales;
  2. When paralleling whales, support vessels will not operate at a speed faster than the whales; all vessels will operate at a constant speed;
  3. Female whales will not be separated from their calves;
  4. Support vessels shall not herd or drive whales;
  5. If a whale engages in evasive or defensive action, support vessels will drop back until the animal calms or moves out of the area;
  6. If dolphins ride the bow or stern waves or frolic near support vessels, support vessels will slow down and keep a steady course; and
  7. If sea lions, seals, or other pinnipeds are hauled out in an area where harm may come to the animal, the animal(s) should be encouraged to move from the hazard area by making noise such as clapping
- In general, vessels should remain at least 100 yards (300 feet or 91 m) away from gray whales to minimize the chance of collision or disturbance. In addition, a marine mammal watch must be maintained at all times while vessels are underway.

Impact/Mitigation:

While the impact of the Proposed Project is not considered to be significant (Class 3), the following measures are recommended to reduce the level of potential impacts even further:

- The principal investigator should not waive the need for aerial surveying and monitoring as stated in the *Wildlife Protection Plan* in the event that a low ceiling or other factor precludes aerial monitoring. Should weather conditions or other factors prevent aerial surveying and monitoring, no detonations should occur until such conditions subside and aerial surveying and monitoring can be conducted.

- Prior to detonation of the charges, a "bubble curtain" shall be placed around the caisson area. The bubble curtain will create a continuous stream of bubbles around the perimeter of the caissons reducing the effects of the explosion on fish. It is also anticipated that the bubble curtain itself will produce enough underwater noise and visual activity to reduce the number of fish within the area surrounding the caissons prior to detonation. This will deter fish from swimming too close to the caissons during the detonation procedure.

BIO-2: Temporary increases in suspended sediments will occur as a result of project activities such as placement of anchors, jetting of material prior toppling of pier columns, toppling the pier columns onto the ocean floor and deposition of quarry rock.

Discussion:

Project activities include anchoring the Load Line Barge (Suislaw) with four anchors, and installation of either one or two preset "West-Coast" can moorings for the M/V Kahu. It has been determined (as described in Section 4.4.6.1, and shown in Figure 4.4-3) that the offshore anchor placements A-1 (southeast) and A-4 (southwest), will be located in sediment. The location of two temporary moorings has not yet been determined; however, if they are located in sediment, similar short-term, insignificant sediment resuspension impacts could be expected. Prior to detonation of the explosives for toppling the pier columns, material located around the base of the caissons will be jetted in order to facilitate the attachment of explosives in their proper position, and to reduce blast effects. In addition, project activities such as toppling of the remnant pier structure's columns may cause a temporary plume of sediment when each of the eight columns lands on the ocean floor. However, based on the two underwater biological surveys (as described in Section 4.4.6.1 and in discussions with local urchin divers) this increase in turbidity should substantial amounts of sediment to the generally turbid conditions that exist around the site. This shall be taken into consideration when categorizing the impact as significant or not.

The Proposed Project activities such as jetting, placement of anchors, or toppling of columns, have the potential to result in the displacement of approximately 24 to 40 cubic yards (18-31 m^3) of sediment. Benthic invertebrates, and pelagic and demersalfish residing on or adjacent to the pier structure or anchor placement areas could be exposed to suspended sediments and infauna (organisms living within the sediments) are likely to be removed with the sediment exposing them to possible physical damage and/or predation. Therefore, it is assumed that there will be some mortality of infaunal organisms residing within the seafloor sediments in these areas. Large, mobile organisms (e.g., fish, large crustaceans, etc.) are expected to depart the area during the disturbance, but would be expected to return shortly after the removal operations.

Adjacent to the areas described above, there would be a zone of sediment deposition that would smother any organisms that are not mobile enough to depart the area. These impacts would be short-term and are not expected to impact any species of special concern. In addition, the affected areas would be expected to be returned to pre-project conditions within a relatively short period of time following demolition and placement of the new structures. Minor sediment-related impacts are also expected when the caissons are repositioned into a nested configuration following demolition. Assuming the demolished caissons will be moved short (*i.e.* less than 10 m) these impacts are considered insignificant and short term.

Short-term, local increases in turbidity are expected to occur during the placement of quarry rock over the toppled caissons. The impacts to immobile epibiota are expected to be insignificant due to the prevailing turbid conditions that those organisms are subjected. The presence of the rock is expected to enhance the low relief, predominantly sedimentary habitat that currently exists under the remnant pier and will provide additional hard substrate that is expected to support kelp and associated epibiota.

As described in the Applicant's Permit Application (2003), the following protective measures are incorporated into the Proposed Project design:

- Offshore anchors will be "flown" via one of the support vessels before being dropped at its pre-determined location. This shall reduce the dragging of anchors across the ocean floor and unnecessary creation of suspended sediment
- Jetting of ocean floor sediments will be minimized to the furthest extent feasible.

Impact/Mitigation:

By following the protective measures outlined in the *Wildlife Protection Plan* (Appendix J), the impacts of the Proposed Project are considered not to be significant (Class 3). Therefore, no mitigation is required.

BIO-3: Impacts may occur to wildlife from potential hydrocarbon-based fuel or lubricant spills from work vessels.

Discussion:

As described in Section 3.3.2, Historical Setting, and Appendix M, *Oil Spill Contingency Plan*, the subject wells PRC-421 Nos. 7 and 10 were capped and abandoned according to Division of Oil and Gas Procedures in the 1950s. The abandonment procedures have therefore eliminated the possibility of a spill from the wells themselves. The only other source of an oil or petroleum hydrocarbon spill would be leakage or spillage of fuel or lubricants from the work vessels and/or equipment used during the Proposed Project.

As described in the Applicant's 2003 Permit Application, to prevent or minimize spill related impacts the following are part of the Proposed Project:

- Well conductor cutting and removal operations will follow the procedures and conditions contained in the Supplemental Notice to be approved by the Division of Oil, Gas and Geothermal Resources and the State Lands Commission.
- ARCO and its contractor shall follow its preventative measures and oil spill response procedures as outlined in its *Oil Spill Contingency Plan* (Appendix M).

Impact /Mitigation:

The above protective measures, integrated into the Proposed Project, will reduce the potential for or impacts of such spills to a less than significant level (Class 3). Therefore, no mitigation is required.

BIO-4: Potential impacts may occur to commercial and recreational fishing.

Discussion:

The Proposed Project will require the use of various vessels and associated anchors. The *Anchor Mitigation and Hardbottom Avoidance Plan* (see Appendix C) indicates a 1,600-ft (448 m) diameter area will be required for the anchoring of most demolition vessels. Water depths within the anchoring area range from approximately 18 to 40 ft (5.5 to 12 m) and include areas likely used by commercial urchin divers, and for crab and lobster trapping.

Similar seafloor habitat as that found within the anchor preclusion area is expected within the approximately 2.7 square mile (7.0 km^2) area of Fish Block 654 that encompasses water depths of from 18 to 40 ft (5.5 to 12 m). Assuming that the commercial resources reported from that Fish Block are expected to occur within those depth ranges and are relatively evenly distributed, the preclusion of the 0.02 square mile (0.05 km^2) area within the anchor pattern is considered an insignificant, temporary and short-term (up to one month) impact.

Commercial Fishing. In general, commercial fishing is limited near the project site by the depth of the water. Commercial fishing for California halibut is conducted greater than one nautical mile (1.9 km) offshore, for Dover sole in at least 1,800 ft (548 m) of water, for rockfish in greater than 180 ft (55 m) of water, and miscellaneous marketfish in at least 600 ft (183 m) of water. Fishing for commercial invertebrates such as ridgeback shrimp and spot prawns occurs in greater than 180 ft (55 m) of water, and for crabs in 60 to 240 ft (18 to 73 m) of water. Commercial urchin diving can occur from the surf zone to 100 ft (10 m). Purse seining for squid could occur along the coast near the project site. As discussed in Section 4.4.2.3, most squid fishing occurs at the Channel Islands.

Project activities will be conducted nearshore and in water depths shallower than those identified above as active commercial fishing depths, other than for urchin diving and crab and lobster trapping. The small area that would be occupied by project related vessels would not result in a significant impact to the purse seine fishery. For the reasons discussed above (small area of project disturbance and relatively shallow water depth), proposed short-term removal activities at PRC-421 are not expected to significantly impact commercial fishing activities in the area.

Recreational Fishing. Offshore activities will not preclude any area of beach from public use (including recreational fishing) unless there is the unlikely requirement of emergency response vehicles to the onshore area. Although the beach onshore from Pier PRC-421 could be used by surf fishermen, the nearest beach access and public parking area is located about 3,000 ft (914 m) to the northwest at Haskell's Beach. This distance substantially reduces the number of surf fishermen at the project site. In addition, the area of beach and marine waters temporarily preempted due to construction activities will be very small in relation to the total beach area available along the Santa Barbara County coast. For this reason, the short-term activities of the Proposed Project will not significantly impact recreational fishing activities.

However, a small portion of coastal waters in the area will be temporarily precluded from public use, such as sportfishing. Appendix G, the *Essential Fish Habitat Assessment* (EFHA) (Littoral Ecological & Environmental Services November 2003) cites CDF&G sportfish catch survey data spanning from 1986 through 1989 for Ellwood and Naples Reef. These data confirm that at least 17 species of fish are harvested from sportfish boats from this stretch of Santa Barbara County coastline. Eleven of these species are federally managed and therefore subject to EFH concerns. The EFHA also cites Shane Anderson, Diving Officer at UCSB, who indicated that the structures provide good habitat for fish and that the abundance and species diversity of fishes around the structures is greater than on the surrounding low-relief reefs or on the sand bottom. He reported that kelp, black-and-yellow, and gopher rockfish are common in the natural kelp habitats in this area, and that lingcod nest in the structures. These natural habitat areas will remain in place upon completion of the Proposed Project and will be enhanced by the addition of additional rock substrate around and near the bird roosting/nesting structure support pilings.

As noted in Section 4.3-Transportation, information regarding the Proposed Project will be posted in the USCG Local Notice to Mariners. Commercial and recreational fishermen will subsequently be able to plan their activities accordingly. Anchoring and demolition information will be provided to the Joint Fisheries/Oil Liaison Office, and posted at the Harbor Master's office and fuel docks at Santa Barbara, Avila, Ventura, and Channel Islands Harbors at least seven days prior to initiation of offshore activities.

Impact/Mitigation:

The adverse effects of the Proposed Project on commercial and recreational fishing are considered not to be significant (Class 3). Therefore, no mitigation is required.

BIO-5: Impacts to roosting/nesting seabirds during the period that the pier is being removed and prior to installation of the proposed roosting/nesting platforms.

Discussion:

The removal of the existing structure will be conducted during September and October to avoid disturbing nesting and rearing activities of protected birds. This timeframe should ensure that fledgling bird species have matured and left their nests as the nesting period is from mid-April through late August. A State-approved biological monitor shall determine if nesting birds

remain on the structure at the end of August. If birds still occupy nests or the structure when work is scheduled to begin, the Proposed Project will be postponed until all the fledging birds have left.

However, roosting species will experience a short-term displacement during the period between demolition of the existing structure and the installation of the replacement habitat, approximately one month. It is expected that resident birds will be occupy alternative onshore and/or offshore roosts near PRC-421, e.g., Ellwood Pier or open beach, until the proposed roosting/nesting platforms are available.

Impact/Mitigation:

The short-term displacement of affected sea birds is not anticipated to be significant (Class 3).

Long-term Impacts. The following are long-term impacts to biological resources associated with the Proposed Project.

BIO-6: Anchoring of the derrick barge and dive service vessel, temporary moorings, and toppling of the caissons may impact hardbottom areas located near the remnant pier structures.

Discussion:

Project activities include anchoring the Load Line Barge (Suislaw) with four anchors, and installation of either one or two preset "West-Coast" can moorings for the M/V Kahu. It has been determined (as described in Section 4.4.6.1) that anchor placements A-1 (southeast) and A-4 (southwest), will be located in sediment. However, anchor placement A-5 (northwest) and A-10 (northeast) will likely be located in hardbottom areas, and anchor lines for all four anchors will be suspended over hardbottom areas. The location of the temporary moorings has not yet been determined, but that placement could also impact hardbottom habitat. In addition, hardbottom areas are located in close proximity to the pier structure, and may be in the fall zone of the columns when they are toppled. These hardbottom areas support subtidal macrophytes such as giant kelp and other biota. Accordingly, most established kelp forests in the SCB occur over hard substrate (Dailey et al. 1993). These rocky habitats also serve as safe sites for numerous subtidal fish and invertebrate species.

To minimize the impacts of the Proposed Project on hardbottom areas the following have been incorporated:

- Mapping of hard bottom and kelp has been performed for the project area (see Figure 4.1-1, Figure 4.4-3, and Appendix C).
- Protection of hard bottom habitat has been designed into the project through the *Anchor Mitigation and Hard Bottom Avoidance Plan* (Appendix C).

- Pre-designated anchor placements have been chosen to be located, where feasible, in sedimentary-bottom habitat. These anchor placements are based on 1999 survey information and will be adjusted following the pre-project survey performed approximately 30 to 60 days prior to site arrival of the offshore spread.
- Anchors will be "flown" via one of the support vessels before being dropped at its pre-determined location. Precise pre-determined anchor placements are located using DGPS positioning system. This eliminates the dragging of anchors and their towlines across the ocean floor over hardbottom areas.
- Anchor lines will be suspended from crown buoys to the vessel and surficial kelp will be cut to a maximum depth of 4 ft (1.2 m) below the surface to decrease the loss of kelp from anchoring lines.

Also, some of the mitigation measures undertaken to protect kelp (BIO-7) will have the additional benefit of lessening or preventing impacts to hard bottom habitat.

Impact/Mitigation:

Implementation of the protective measures in the Proposed Project will result in controlling impacts to a level that are not considered to be significant (Class 3).

While the impact of the Proposed Project is not considered to be significant, the following mitigation measures are recommended to reduce potential impacts further:

Mitigation Measures BIO-6:

- A State-approved construction or biological monitor shall confirm that the areas to which the anchors are flown are located at the pre-determined anchor placement locations.
- The anchor locations shall be ground-truthed by a diver immediately prior to project operations in order to determine whether anchor site revisions could reduce kelp and hardbottom habitat impacts.
- Prior to installing the temporary mooring buoys, a diver-biologist survey will be conducted to ensure that kelp and hard bottom substrate is avoided.

BIO-7: Loss of kelp bed habitat for fish may occur as a result of anchor lines, placement of temporary moorings, toppling of the pier caisssons, and removal of other pier remnant structures.

Discussion:

As discussed in Section 4.4.6.2, much of the project area supports kelp beds growing from the hardbottom areas on the ocean floor. Kelp is thick throughout the eastern portion of the anchoring areas and is likely to be impacted irrespective of anchor locations there (Appendix

I, L.A. de Wit). As stated above, anchor placements will be located, where feasible, in sedimentary-bottom areas where kelp beds are less likely and kelp density is lower than in hardbottom areas. Scattered kelp was observed by Littoral Ecological & Environmental Services' analysis of Oceaneering International's videotape of its *Construction Dive Survey* (Appendix H). Dense kelp was observed in these same videotape images on the rock pile that lies inshore of the pier. However, the quantity of giant kelp on all of the structures, except the rock pile, appeared to be small according to Littoral Services' analysis. Thus, the loss of the existing steel supports and caisson remnants supporting kelp should not create a significant reduction in kelp biomass.

Figure 4.4-3 indicates that kelp does exist immediately around the remnant pier. With the demolition of that structure and the subsequent placement of the caissons and rock on the seafloor, a relatively small area of kelp will be lost. It is, however, expected that the removal of the remnant pier that currently shades the area directly below it and the addition of rock will result in a net increase in solid substrate and thus kelp recruitment. The potential loss of kelp is considered insignificant because of the net increase of hardbottom substrate provided by the Proposed Project.

To minimize the impact of the Proposed Project on kelp, the Applicant's Permit Application (2003) includes the following:

- Anchor placements will be kept to a minimum number, located in sedimentary habitat, and will be placed in a manner in which movement of vessels will be minimized.

Impact/Mitigation:

This adverse effect is not significant (Class 3); however, the following mitigation measures are provided to reduce adverse impacts further.

Mitigation Measures BIO-7:

- Two weeks prior to anchoring vessels, kelp will be harvested to a depth of 4 ft (1.2 m) below the sea surface along the inshore anchor corridors.
- The inshore anchors will be pre-positioned and secured to the vessels via "soft line" from a pennant buoy attached to the anchor.
- Any kelp habitat lost due to offshore activities will be reported to the NMFS pursuant to Section 305(b) of the Marine Fishery Conservation and Management Act (MFCMA).
- The imported rock fill, which has kelp attached to it, will not be removed.
- A pre- and post-project underwater biological survey will be conducted to determine if kelp plants were lost during offshore activities. The results of the post-project survey and the comparison with pre-project conditions will be used to determine the need for and scope of a kelp restoration plan. Maps of hardbottom and kelp features

prior to project implementation have been provided in Figures 4.1-1 and 4.4-3 and will be updated no more than 30 days prior to initiation of project removal activities. Maps of these features subsequent to the Proposed Project will be provided in the Project Completion Report (to be completed within three months following completion of removal of the PRC-421 pier remnants).

- The need for any kelp replacement will be based upon a methodology and significance criteria to be pre-approved by the applicable permitting and regulatory agencies, e.g., CSLC, CCC, NMFS.

- If determined necessary, kelp replacement may be accomplished through artificial attachment of juveniles or sub-adult plants to substrate within the affected area or other method approved by the permitting and resources agencies. (The University of California Santa Barbara and Kelco [a commercial kelp company] have developed methods and successfully completed transplants by attaching recruit, juvenile, and adult plants to rock substrate.)

BIO-10: A long-term impact on commercial and recreational fishing would occur.

Discussion:

As described previously, commercial fishing is limited in the project area by depth of water and existing substrate conditions to mainly urchin, crab and lobster fishing. Recreational fishing may target a variety of fish as well as invertebrates. The Proposed Project would add a relatively small area (approximately 170 feet [51.2 m] across) of hardbottom substrate. Over time this high relief substrate would support kelp, invertebrate, e.g., urchin, sea cucumber, rock crab, and fish, e.g., surf perch, rock fish, populations. Therefore, over the long-term, the Proposed Project would result in a minor benefit to commercial and recreational fishing.

Impact/Mitigation:

This impact is considered to be beneficial (4).